PLANMECA
E4D TECHNOLOGIES

Elements of Success
Training Workbook & Resources

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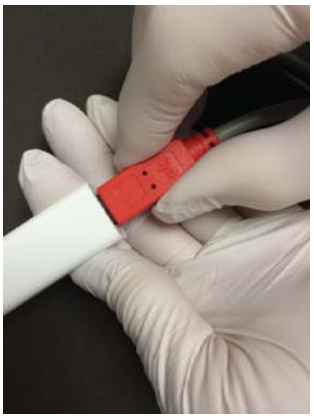
Removable Components

The PlanScan system has a set of removable components.

Connecting the Thunderbolt™ Adapter



Properly connecting and disconnecting the scanner prevents damage to your devices.

1. Insert the Thunderbolt adapter into the adapter slot on the side of the laptop. (The adapter should remain attached, even when not in use.)
2. After opening the PlanCAD software, connect the red FireWire connector of the scanner into the white Thunderbolt™ adapter.

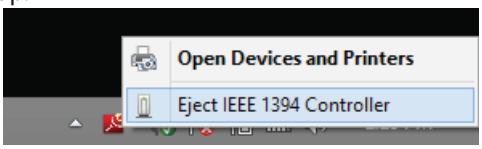
The laptop gives an audible signal to confirm that the connection is fully seated.

To remove the scanner, hold the red end with one hand and with the other hand grasp the Thunderbolt adapter. Gently pull apart to disconnect. Leave the white Thunderbolt adapter attached to the computer.

Disconnecting the Thunderbolt™ Adapter

If you wish to remove the adapter from the laptop:

1. Disconnect the scanner and exit Romexis to the Windows desktop.
2. Navigate to the Eject Media icon in the lower left corner of the desktop.
3. Click the icon and choose **Eject IEEE 1394 Controller.**
4. Remove the Thunderbolt adapter from the laptop.



Failure to follow this procedure may result in an inoperable scanner. For additional questions or concerns please contact Customer Support at 800.537.6700.

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Connecting the Scanning Tip

(If scanning intraorally, disinfect the tip before connecting it to the base. See the User Manual for full instructions or the insert that is inside the scanning tip box.)

1. Grasp the body of the scanner with one hand.
2. Use the other hand to press the scanning tip onto the scanner as shown. A locking click is heard once the tip is fully seated.

Disconnecting the Scanning Tip

1. Grasp the body of the scanner with one hand.
2. With your other hand depress the green button on the underside of the scanner. Gently pull the tip from the scanner.

When the scanner is not in use, place the non-functional protective scanner tip on the scanner. *(Included with the scanner during shipping.)*

Failure to follow this procedure may result in damage to the scanner and scanning tip.

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Introduction

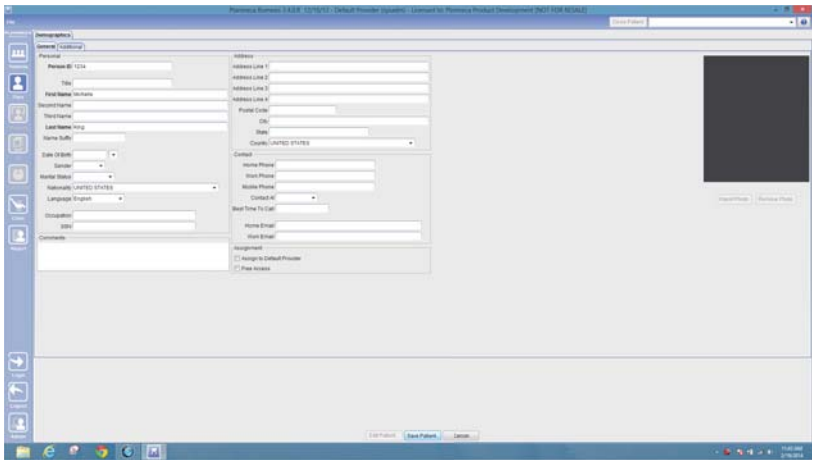
These instructions are intended as an outline to go along with the presenter's instructions and demonstrations. For complete step-by-step instructions, see the Exercise Workbook and User Manual.

Premolar Crown with Buccal Bite

Tooth #5 (1-4 ISO)

Home

1. On the main screen, click **Add Patient** and add your name in the patient demographics screen.
2. Complete the options in bold.
3. Click **Save Patient** at the bottom of the screen.



4. Click **CAD/CAM.**

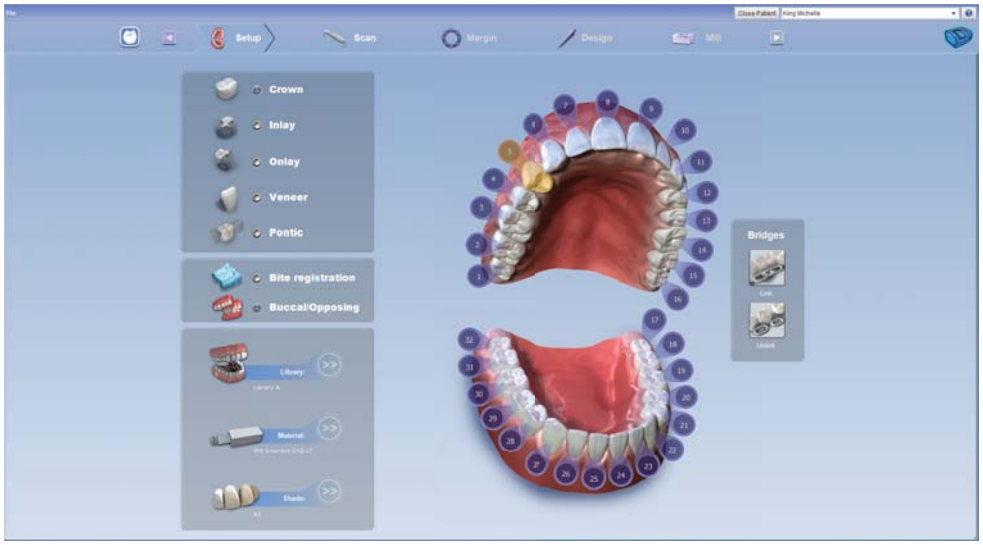
5. Under **Scan & Design New Restoration** click **New Scan and Design.**

The Setup tab displays. *(A User Account Control dialog may appear, choose YES to continue)*

Setup

Enter the setup information for this case:

- **Tooth 5 (1-4 ISO)**
- **Crown**
- **Buccal/Opposing**
- **Library A**
- **Empress CAD LT**
- **Select shade A1**



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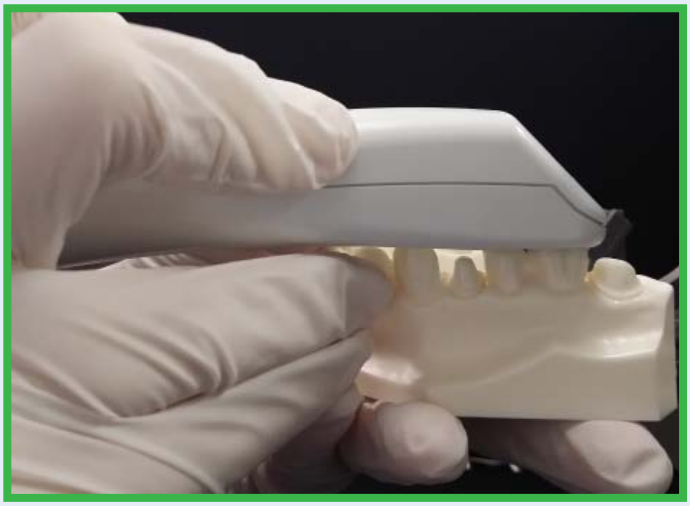
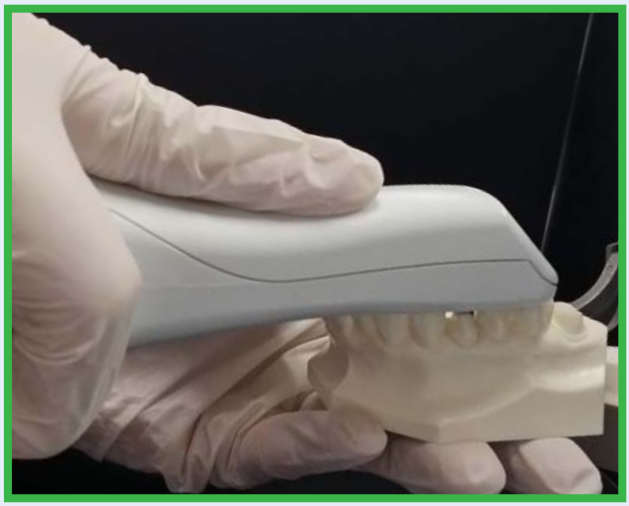
For Your Information

- Hold the scanner close to the tip like a handpiece or overhanded. Rest the neck of the scanner on the adjacent teeth.





- The tip of the scanner should point towards the distal of the preparation.

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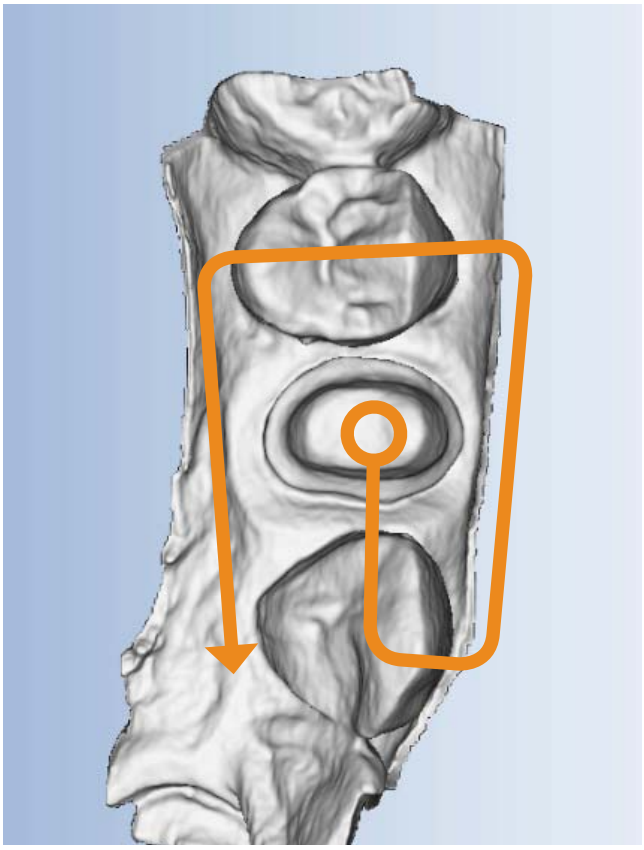
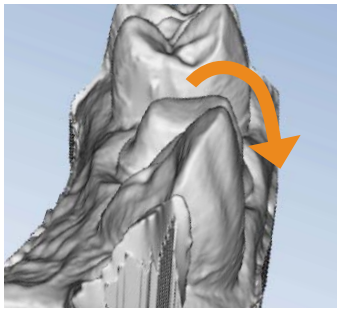
Basic Scanning Pattern

Begin scanning directly over the occlusal surface of the preparation. Move in a gradual, continuous motion toward the mesial neighbor. Transition from the occlusal, cusp, axial wall, to gingival surfaces. The scanner should be held as close to 90° while scanning parallel to the buccal surface.





Goals

100% of the prep and interproximal contact areas

90% of the adjacent teeth

Good axial data for design

2-3 mm gingival tissue on buccal and lingual

Overview

1. Click the **Scan** tab.
2. Pick up the scanner.
3. Activate/Deactivate the scanner by clicking the button on the scanner or pressing the **Spacebar** on the keyboard.
4. Scan the model.
5. Click **Generate Model** or press **M** on the keyboard to finish building the virtual model.

Occlusal scans

1. Begin scanning directly over the preparation.
2. Keep the scanner parallel to the occlusal table. Move in a gradual, continuous motion toward the mesial neighbor.
3. Be sure to focus on the building model in the software.

Note: You do not need to look at the model during scanning. Keep your eyes on the screen and use the building model and the live view to track your progress and current position.

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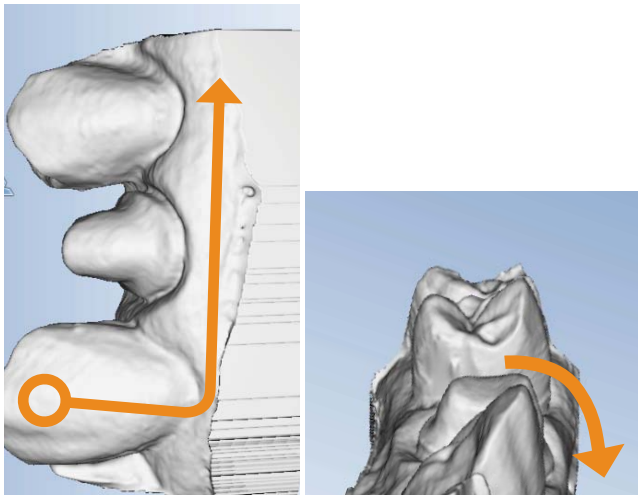
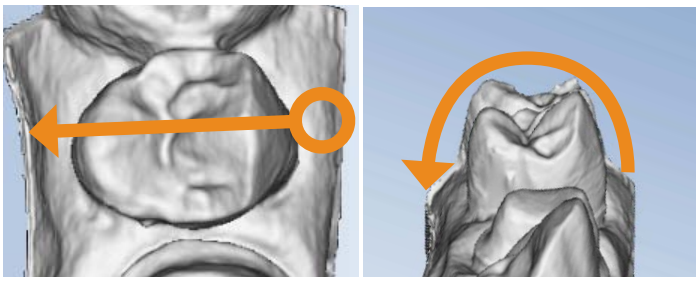
Buccal scans

1. Use small rotations over the mesial neighbor, transition from occlusal, cusp tip, buccal wall, to gingival.
2. Scan along the buccal surface of the teeth. Rotate the scanner to almost 90° from the occlusal table.
3. Watch as your model builds to see any areas that might require a different rotation or angle.



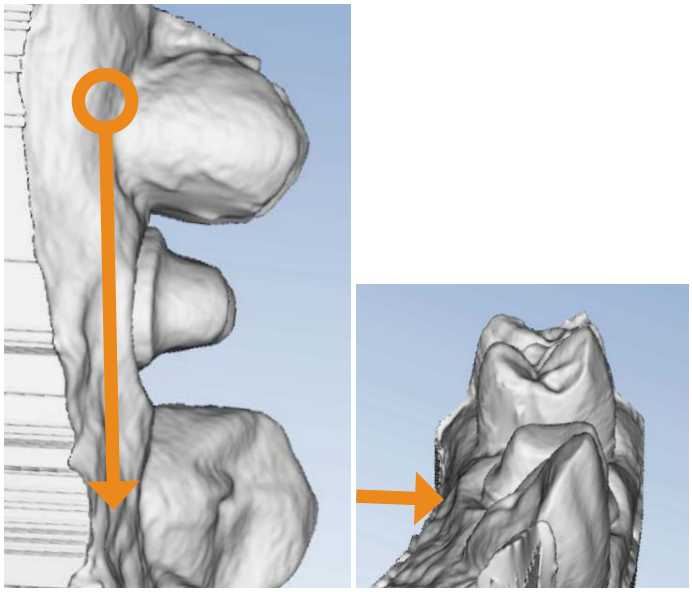
Distal Tooth

To capture the occlusal data of the distal tooth, transition across the occlusal table until you reach the lingual surface.



Lingual scans

1. Scan along the lingual surfaces of the teeth. Rotate the scanner to almost 90° from the occlusal table.
2. Complete the scan pattern at the lingual of the mesial neighbor.



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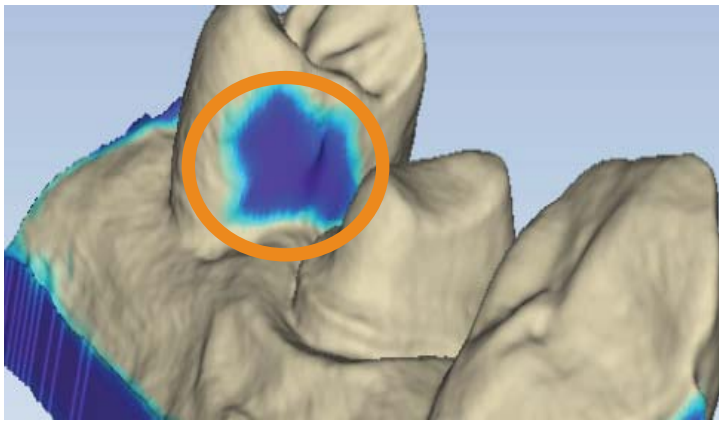
Evaluate the model

1. Click **Generate Model** or press **M** on the keyboard to finish building the model.
2. Use the mouse to rotate, move and zoom in and out to evaluate the model.

Select position pointer on item and click left button to select	**Rotate Model** press and hold the right button, then drag
Zoom Model rotate the wheel button to change the size of the model on the screen	**Move Model** up/down, left/right: press and hold the wheel button, then drag.

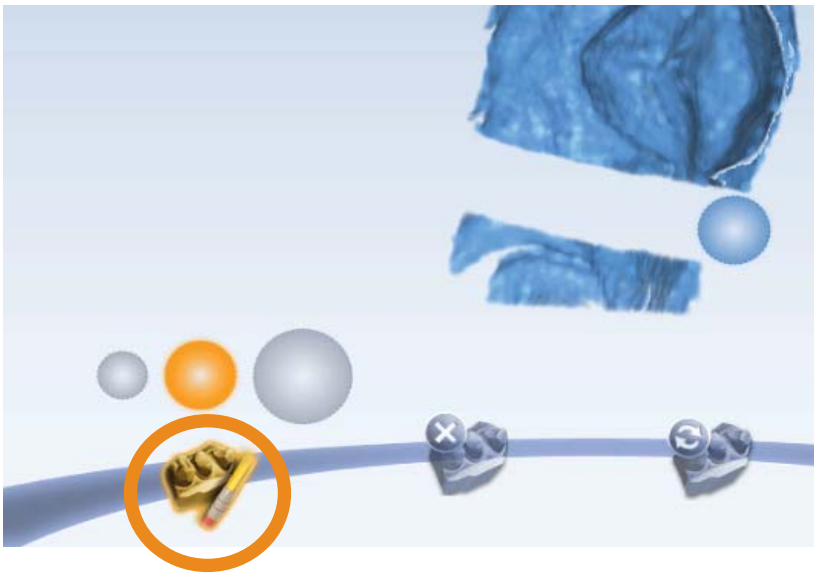
3. Click **Data Density View**. Dark areas indicate low data. There should be NO dark areas on the margin or axial walls of the preparation or on the contact areas of the neighboring teeth (circled below).



4. Fill in the required missing data.

Ensure your model has 100% of the preparation, 100% of the interproximal contact area, and at least 90% of the adjacent teeth. Be sure to capture the full cusp tips of the adjacent teeth.

5. Erase any unnecessary data such as extra teeth, tongue, cheek, and cotton rolls.



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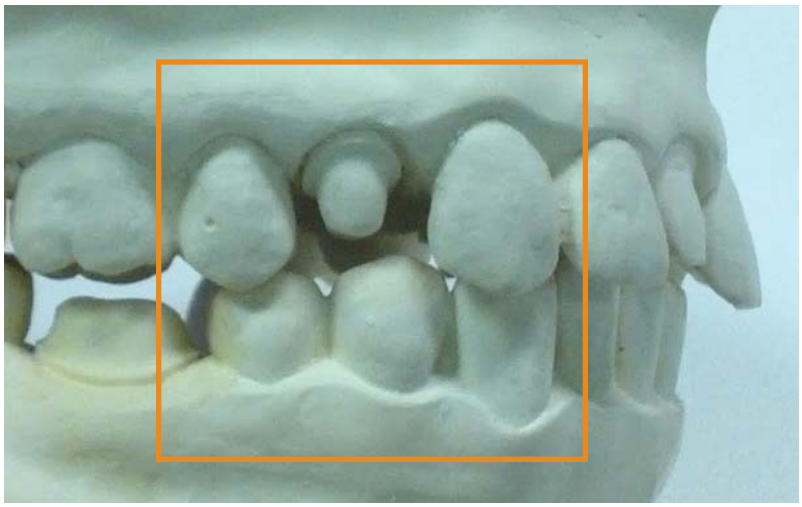
Buccal Bite and Opposing

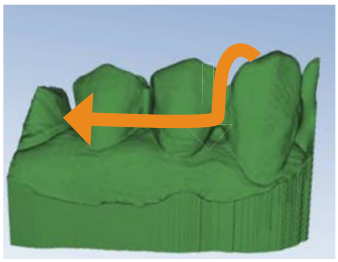
The opposing teeth are scanned to acquire bite information for the proposal. The buccal bite is scanned to align the preparation model with the opposing model. Scan all of the teeth that are in opposition to the teeth in the preparation scans.



Note: Many clinical operators scan the Opposing while the patient is being anesthetized.

Scan Opposing

1. Click **Opposing.**
2. Starting with the distal tooth, scan the occlusal data.
3. Transition to the buccal and scan the buccal side of the opposing dentition. Include 2-3 mm of gingival data; do not stop halfway down the tooth. (Cusp tip, axial wall, gingival)



Goals

100% of the occlusal and buccal surfaces

2-3 mm gingival tissue on the buccal surface

Lingual data not necessary

4. Erase any unnecessary data such as tongue, cheek, and cotton rolls.

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Scan Buccal

1. Click **Scan Buccal.**
2. Close the articulated model gently. If it shifts during the scanning, the alignment may be incorrect.
3. Scan the buccal surfaces of the teeth that were captured in the preparation and opposing models. Ensure some gingival data is captured.

Goals

Capture the buccal surface of the dentition in the prep and opposing

2-3 mm gingival data

No rotations necessary

Note: Be sure to verify the status of the buccal alignment.

In most cases, alignment will be done automatically by the software.

A green dot in the Buccal icon indicates a successful alignment.

NOTES:

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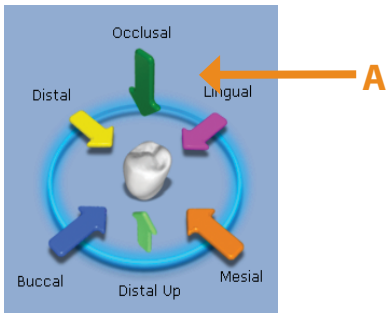
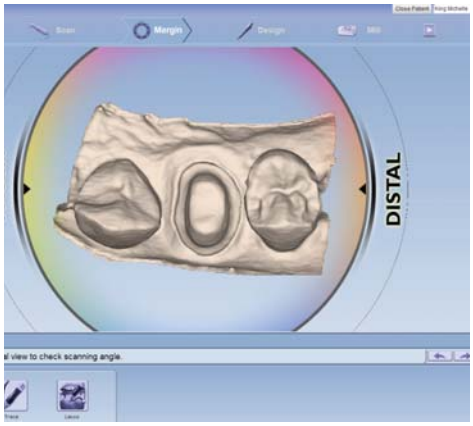
Evaluate and Adjust the Orientation

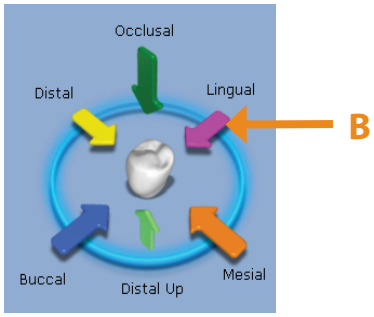
1. Click the **Margin** tab.
2. Evaluate and adjust the Orientation using **View Controls** to change the point of view.

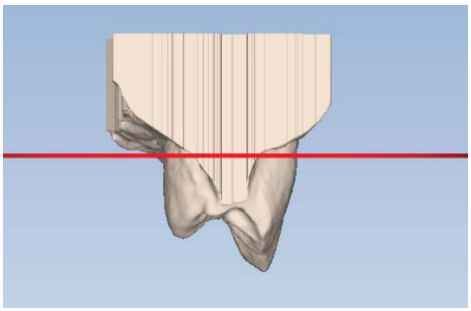
   A. In the Occlusal View, balance the model from buccal to lingual.



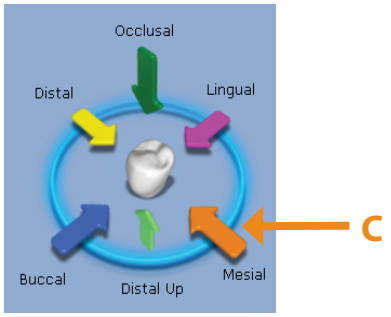


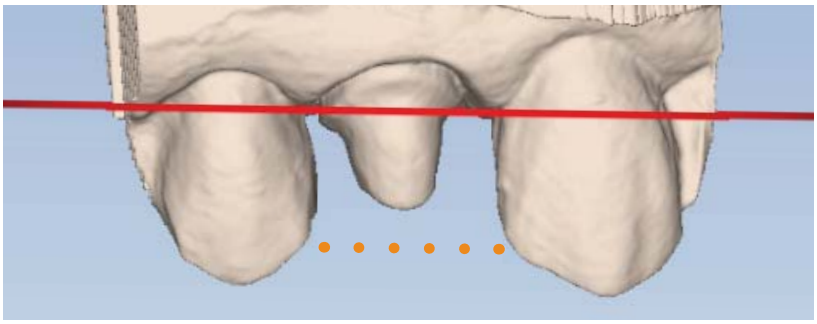
   B. In the Distal View, align the buccal cusps of the neighbors.





   C. In the Buccal View, evaluate marginal ridge alignment.





3. Click the **Orientation** icon to accept the current position.

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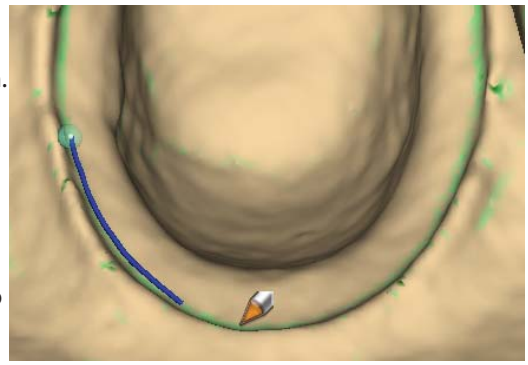
Mark the Margin

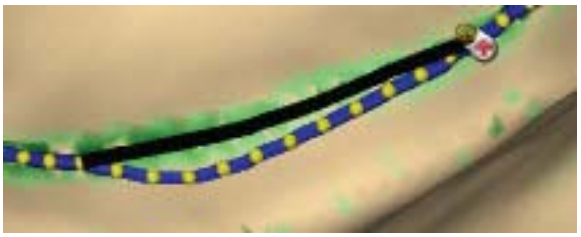
1. Click **Show Features.** Show Features highlights areas of high contour, which helps define the margin.
2. Zoom in on the preparation.
3. Click **Trace** and click on the inside of the green line along the margin.
4. Moving in small increments, click as you move around the preparation.



Don't worry if you make a mistake while drawing the margin. It is easy to edit the margin.

5. The margin is finished when the original point (blue dot) is clicked to finish the circle.
6. Practice adjusting the margin with both **Move Margin** and **Add Segments**.

Move Margin is used for minor adjustments.

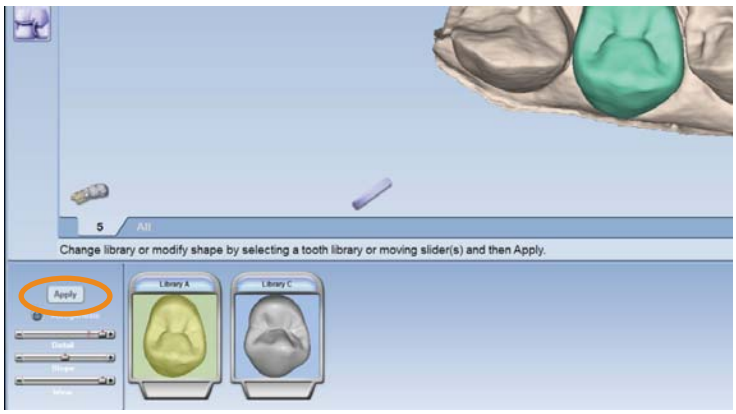


Add Segments is used to redraw a section of the margin.

Design

1. Click the **Design** tab.

The **Tooth Libraries** screen appears.



2. Click **Apply** to generate the proposal.
3. Click **Incremental Tools** for large adjustments.
4. Click **Freeform Change Tools** for small adjustments.
5. Click **Material Thickness,** the proposal should be blue/green with a yellow margin.

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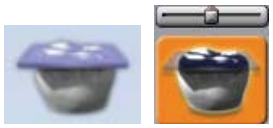
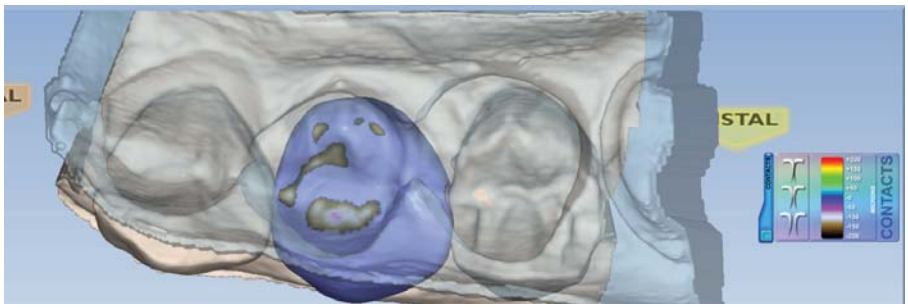
6. Click **Rubber Tooth** and adjust the axial walls, marginal ridges, and embrasures.

7. Click **View Bite Registration** to see the opposing dentition model above the proposal. Click **View Bite Registration** a second time to make the template transparent.



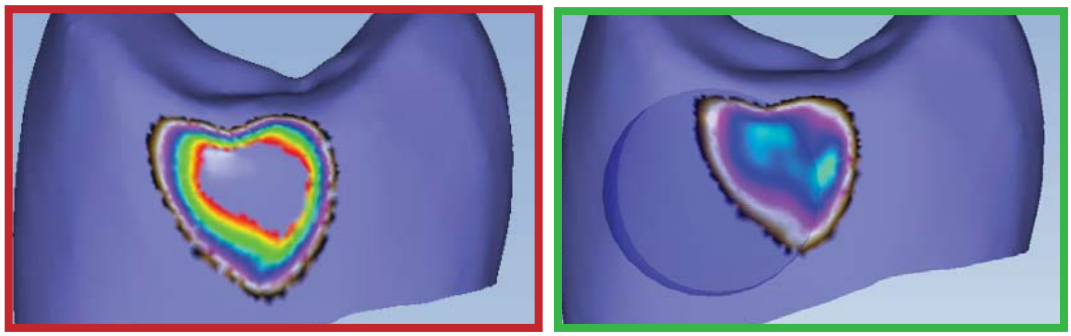
8. Click **View Contacts.**



9. Click **View Bite Registration** again to deactivate the template.

10. Click **Hide Model** to remove the model from view.

11. Rotate the proposal to view the interproximal contacts. Adjust interproximal contacts as needed. The goal is dark blue with a hint of aqua.



12. Deactivate **Hide Model.**

13. Deactivate **View Contacts.**

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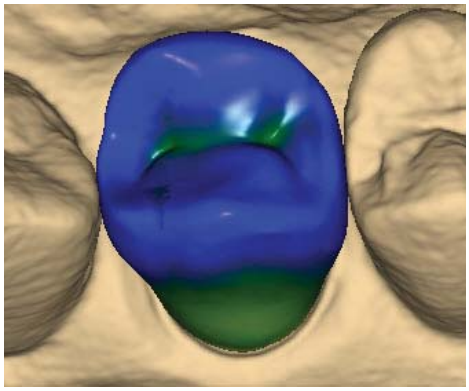
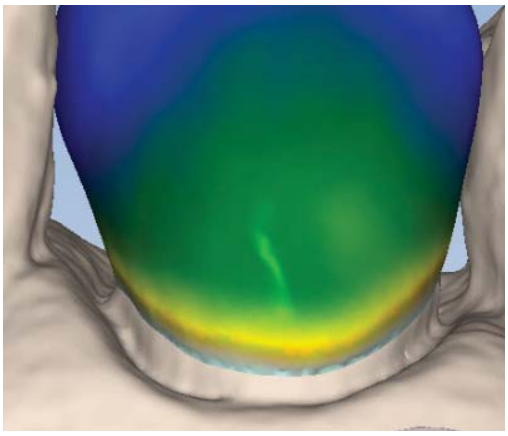
14. Click **Material Thickness.**

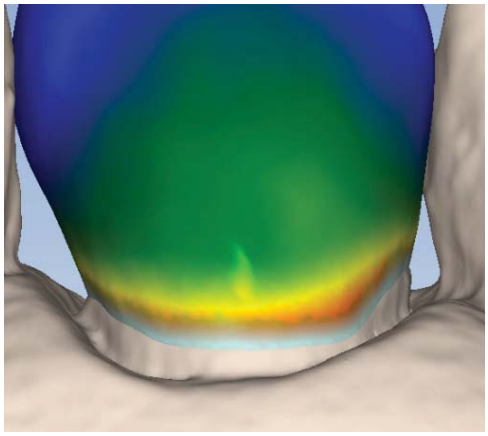
The desired material thickness is based on the block manufacturer's recommended thickness for your restoration type. The desired material thickness for a crown is 1-1.5 mm along the axial walls (bright green - dark green) and 1.5-2 mm on the occlusal table (dark green - blue).



15. Evaluate the margin. The material thickness should be yellow around the margin with no red or orange.



Good example - yellow margin



Poor example - Red or orange along the margin

16. If there is red around the margin, click **Move Margin** to evaluate the margin for accurate placement.

The proposal becomes transparent so that the margin is visible. Do NOT go back to the Margin tab to make the changes or you will lose all of the design work that has been done.

17. Adjust the margin if needed.

18. If the margin is in the correct place, use the **Dropper** tool to add material thickness.

End of exercise. Do not proceed to the Mill tab.

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Posterior Crown with Selection Area

Tooth #30 (4-6 ISO) with bite registration

Setup

Enter the setup information for this case:

- **Tooth 30 (4-6 ISO)**
- **Crown**
- **Buccal/Opposing**
- **Library A**
- **e.max HT**
- **Select shade B1**

Scan Prep

Scan prep using the basic scan method.

Begin scanning directly over the occlusal surface of the preparation. Move in a gradual, continuous motion toward the mesial neighbor. Transition from the occlusal, cusp, axial wall, to gingival surfaces. The scanner should be held at close to 90° while scanning parallel to the buccal surface.

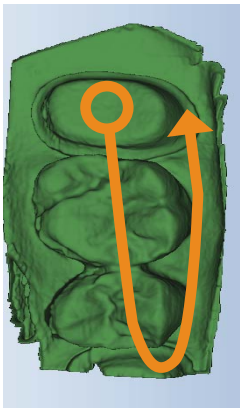
Use small rotations over the mesial proximal tooth, transition from occlusal, cusp tip, axial wall, to gingival.

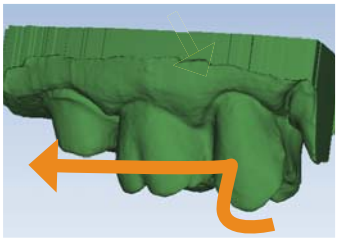
Scan along the lingual surfaces of the teeth. Rotate the scanner to almost 90° from the occlusal table.

Watch as your model builds to see any areas that might require a different rotation or angle.

Scan Opposing

1. Click **Opposing.**
2. Starting with the distal tooth, scan the occlusal data.
3. Transition to the buccal and scan the buccal side of the opposing dentition. Include 2-3 mm of gingival data, do not stop halfway down the tooth. (Cusp tip, axial wall, gingival)





Goals

100% of the occlusal and buccal surfaces

2-3 mm gingival tissue on the buccal surface

Lingual data not necessary

4. Erase any unnecessary data such as tongue, cheek, and cotton rolls.

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Scan Buccal

1. Click **Scan Buccal.**
2. Close the articulated model gently. If it shifts during the scanning, the alignment may be incorrect.
3. Scan the buccal surfaces of the teeth that were captured in the preparation and opposing models. Ensure some gingival data is captured.

Goals

Capture the buccal surface of the dentition in the prep and opposing

2-3 mm gingival data

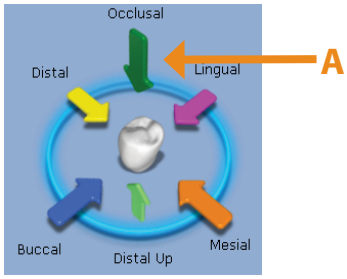
No rotations necessary

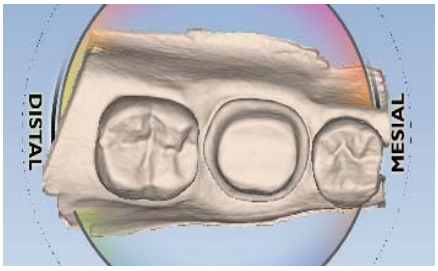
Note: Be sure to verify the status of the buccal alignment.

Margin

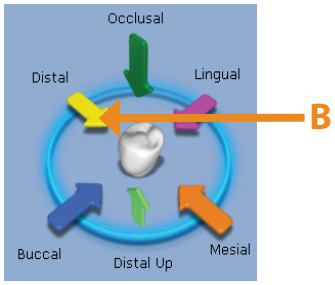
1. Click the **Margin** tab.
2. Evaluate and adjust the Orientation using **View Controls** to rotate the model.

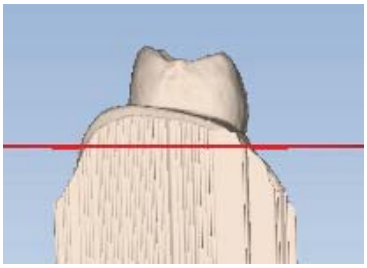
A. In the Occlusal View, balance the model from buccal to lingual.



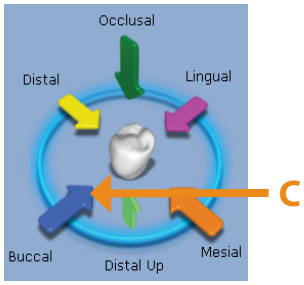


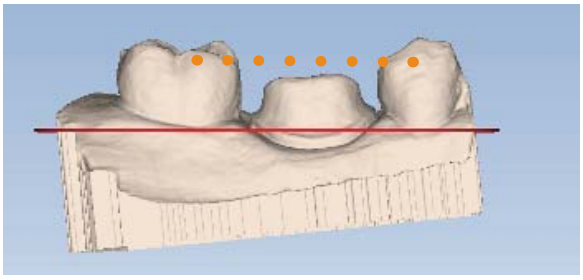
B. In the Distal View, align the buccal cusps of the neighbors.





In the Buccal View, evaluate marginal ridge alignment.





3. Click **Orientation** to accept the current position.

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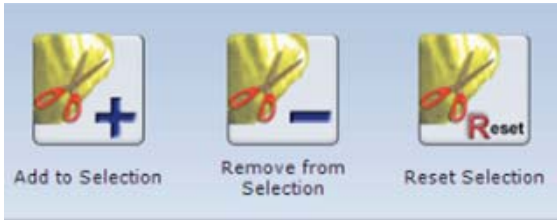
In some cases, the adjacent teeth are close enough to the preparation to make the identification of the margin in the interproximal areas difficult. For this exercise, Selection Area is used to isolate the preparation. This is an optional step for full coverage crowns. Selection Area is required for partial restorations and will be discussed more later.

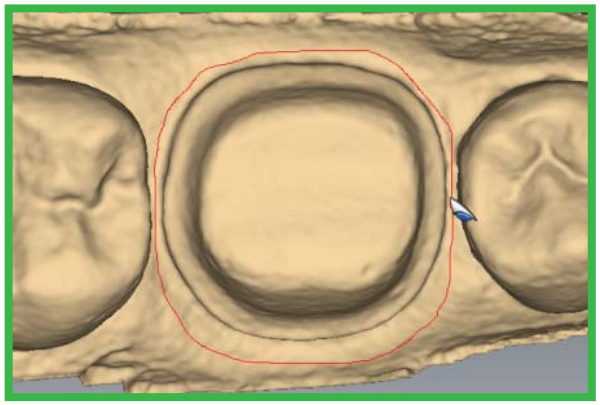
4. Click **Selection Area** on the left side of the screen.

New options appear at the bottom of the screen.

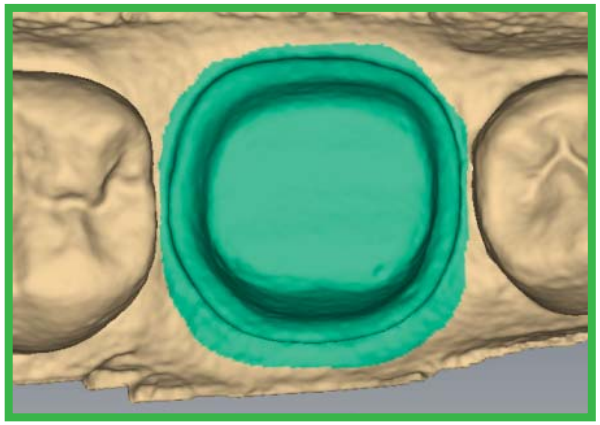


5. Click **Add to Selection.** Left click and hold to draw.

6. Draw a circle around the preparation. Do not include any part of the adjacent teeth.



7. Release the mouse button as you finish the circle. The selected area is highlighted.



8. To add more to the designated area, click **Add to Selection.** Ensure all of the margin is in the highlighted area.

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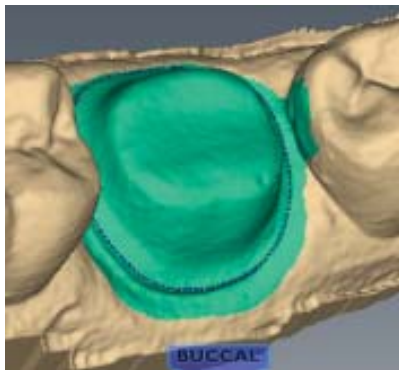
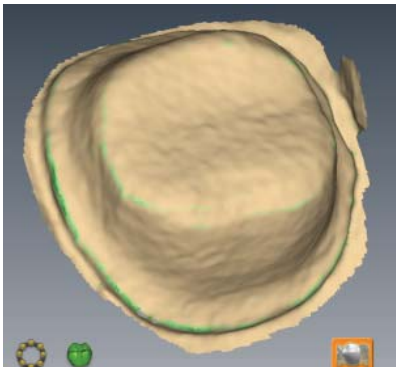
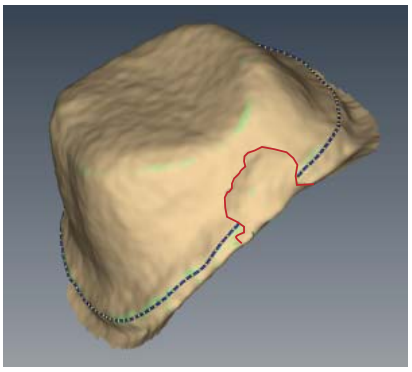
9. Rotate and evaluate the Selection Area. Ensure portions of the adjacent teeth are not in the highlighted area. Click **Remove from Selection** and circle the extra information if needed.



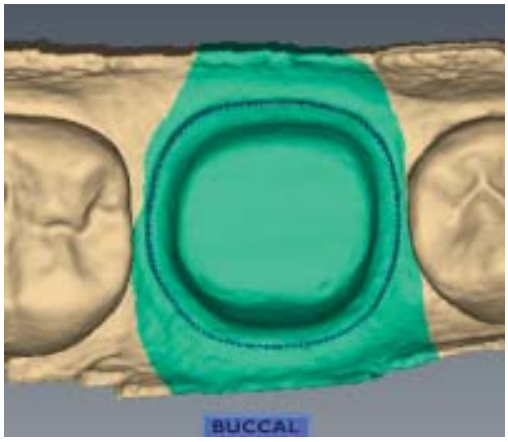
Poor - Selection Area includes part of the adjacent teeth. This is sometimes not noticeable from the occlusal view.



If part of an adjacent tooth is selected, that selection is part of what displays when Hide Model is activated.

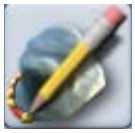


This piece of the adjacent tooth can make it difficult to see the margin on that side of the tooth. (Outlined in red above)



Poor - If too much of the gingival tissue is selected, the proposal will be distorted. Selection Area should be close to the size of the final proposal.

10. Click **Margin Tool** on the left. The options on the bottom of the Design Center appear for marking and editing the margin.



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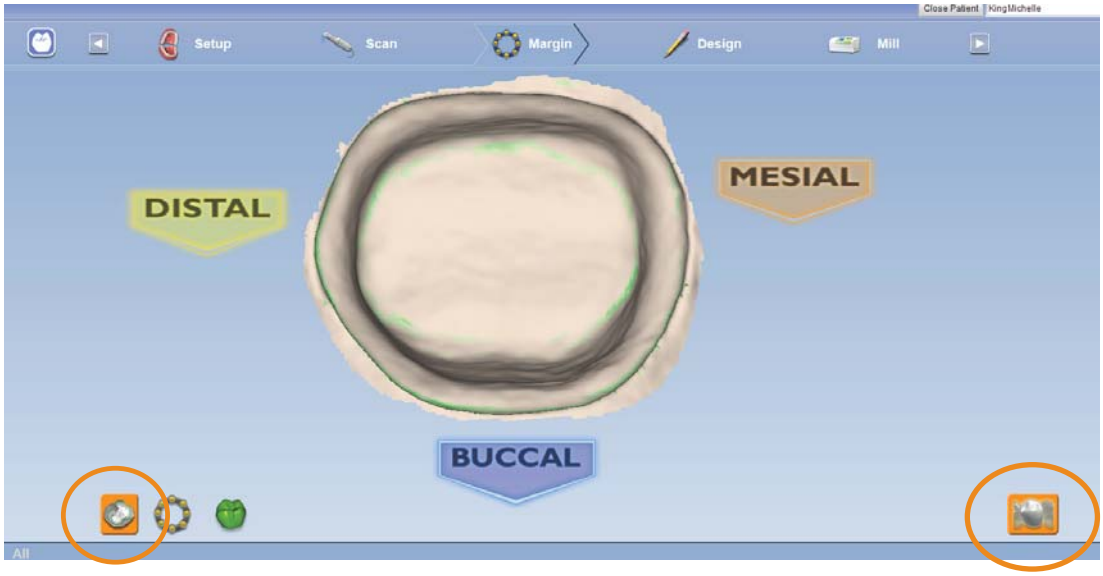
11. Click **Hide Model.** Only the designated Selection Area displays. The rest of the model is hidden.
12. Click **Show Features.** Areas with high contours are highlighted. This can help identify the margin.



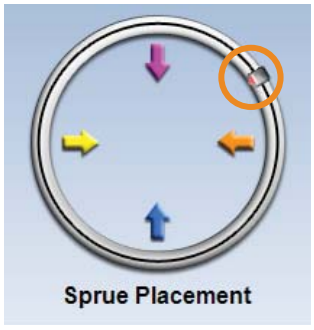
13. Click **Trace** and mark the margin from the occlusal view. Verify placement by rotating the prep model in different views.
14. Edit the margin if needed.

Design

Click the **Design** tab. Follow the CAD/CAM Workflow sheet.

Mill

1. Click the **Mill** tab. The proposal turns white and shows the default position for the sprue.
2. Change the location of the sprue on the restoration, if desired, by moving the placement indicator (circled in orange below) along the circle that represents the exterior of the restoration or by clicking one of the arrows.



End of exercise. Follow the instructors direction for Material Block Size and Milling.

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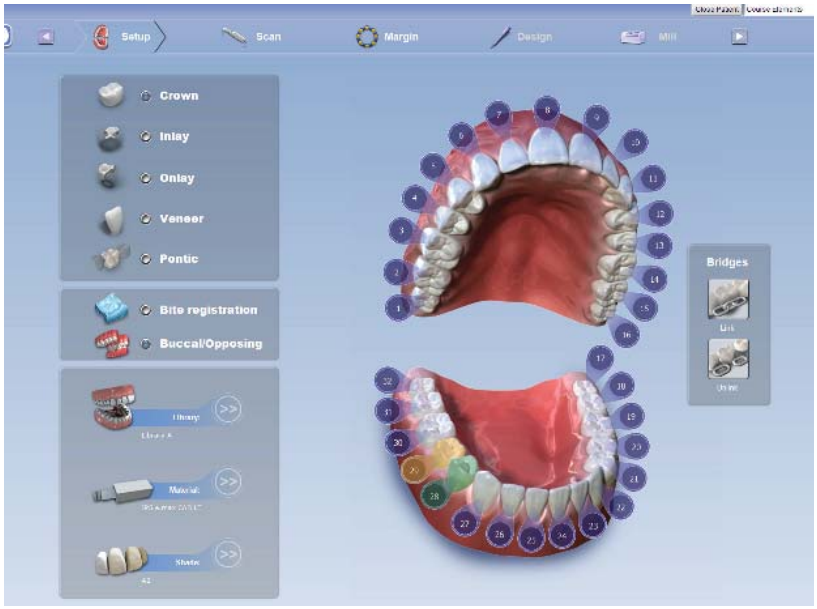
Multiple Posterior Crowns

Tooth #28 and 29 (4-4 and 4-5 ISO) pre-scanned case

Setup

This case has already been created.

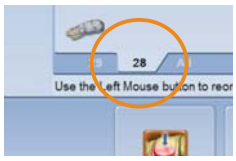
On a multiple restoration case, each tooth requires a restoration type, library, material and shade. Note that the currently selected tooth is orange while the other selected teeth are green.



Margin tab

Since this case has already been scanned, we are going straight to the Margin tab.

1. Click the **Margin** tab.
2. Click **Orientation** to activate it.
3. Adjust the Orientation for **Tooth 29 (4-5 ISO).** The highest tooth number is selected by default.
4. Click **Orientation** to accept the position for the selected tooth.
5. Click the **Tooth 28 (4-4 ISO)** tab.



6. Click **Orientation** to activate it.
7. Adjust the Orientation for **Tooth 28 (4-4 ISO).**
8. Click **Orientation** to accept.

Note: The margin for Tooth 29 (4-5 ISO) has already been marked.

9. Click **Show Features** to activate it. The tab for Tooth 28 (4-4 ISO) should still be selected.

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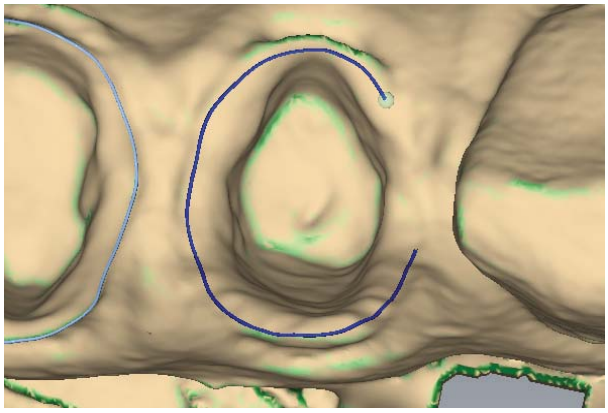
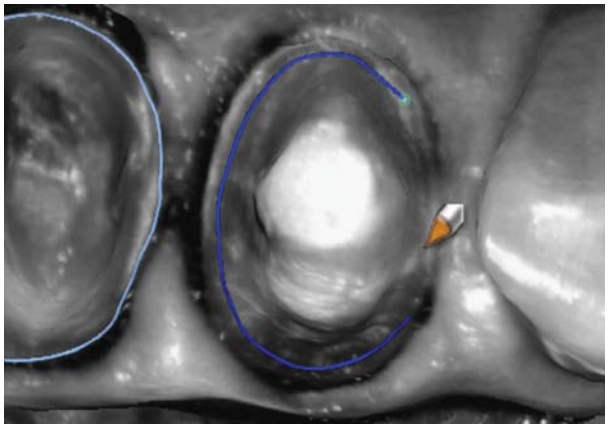
10. Click **Trace.** Mark the margin where it can be seen on the stone model. The mesial side of the preparation is not supragingival and cannot be clearly seen on the stone model.

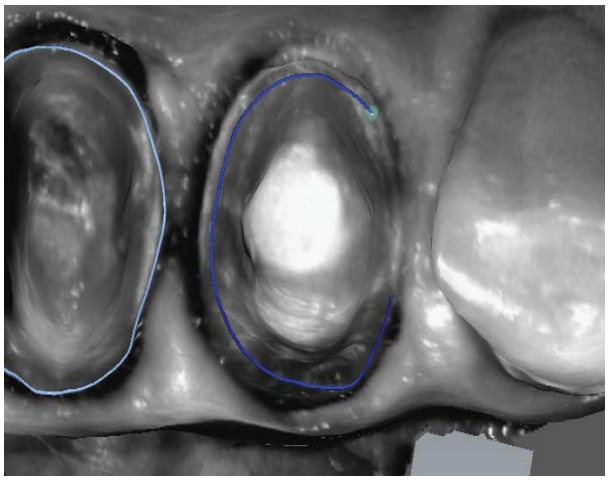


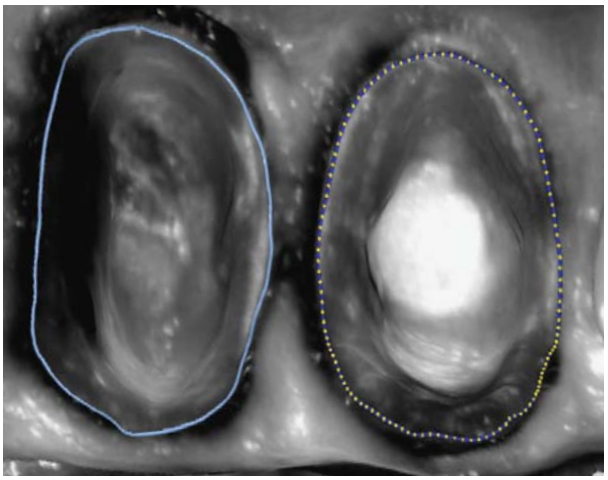
11. Click **View ICE.**

ICE appears over the model.



12. From the occlusal view, zoom in. Use the ICE view to draw the remainder of the margin directly along the margin of the preparation.





Note: ICE View can only be used on intraoral scans and should only be viewed from the occlusal angle.

13. Deactivate ICE View.

14. Evaluate and adjust the margin.

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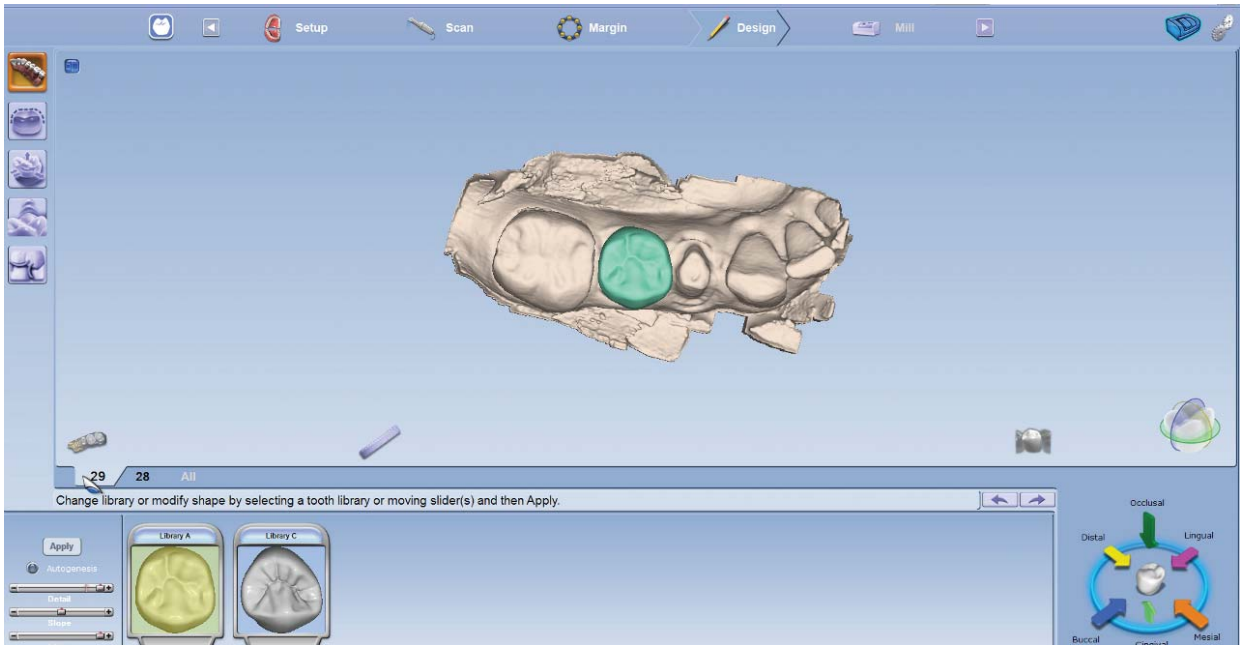
Design Tab

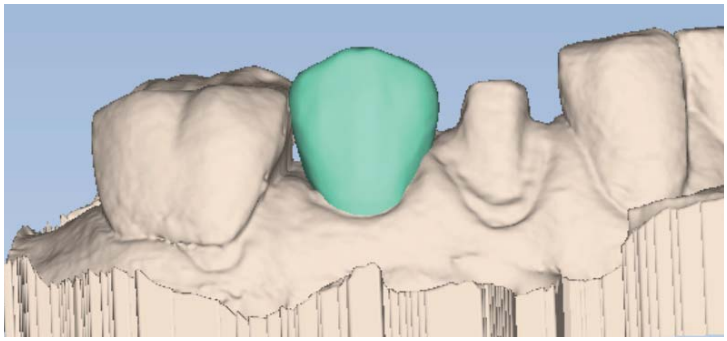
1. Click the **Design** tab.
2. Click the **Tooth 29 (4-5 ISO)** tab.

The preview tooth displays as an overly large tooth. It must be resized and repositioned.

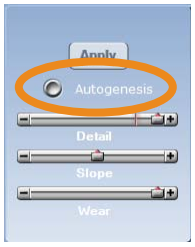


Click other libraries to view or change the anatomy.

3. Press the **Alt** key and the **up or down arrow** on the keyboard until the preview tooth is similar in size to a premolar.
4. Reposition the preview tooth over the center of the prep. Rotate the model to the buccal view to verify positioning.



5. Deselect **Autogenesis.** If Autogenesis is active for the first proposal, it will attempt to make contact with the preparation of the neighboring tooth and become distorted.



6. Click **Apply.**

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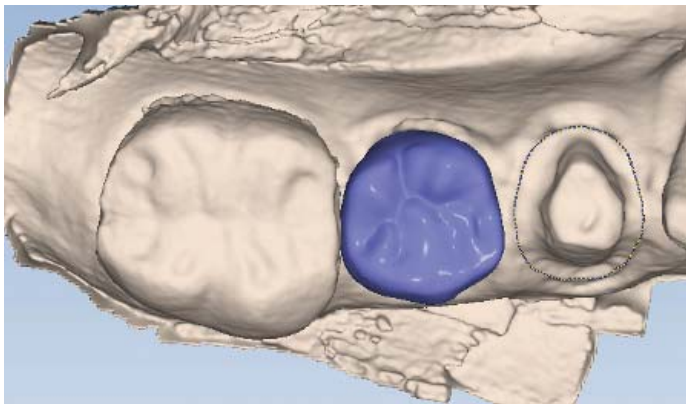
The proposal is generated.

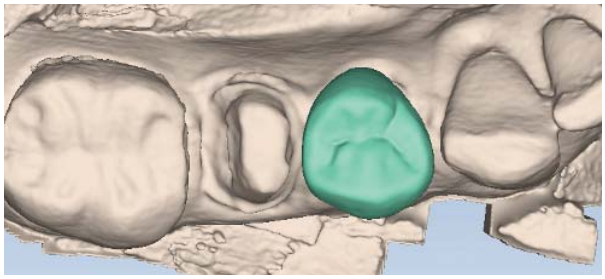


7. Use the design tools to create a good contour/shape for the first tooth before generating the proposal for the second tooth.

8. Click **Tooth Library.**

9. Click the **Tooth 28 (4-4 ISO)** tab.

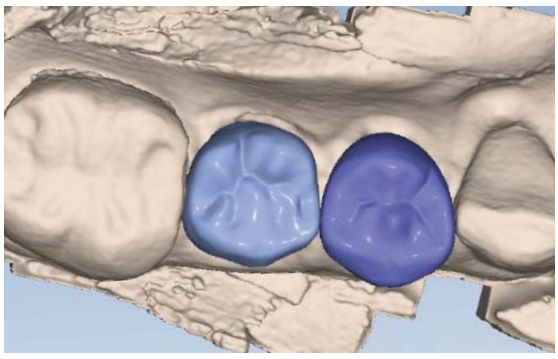
The proposal for Tooth 29 disappears from view, but the proposal has not been lost.



10. Click **Autogenesis** to activate it. Since the first tooth was already generated, Autogenesis will create contact with the first proposal instead of the preparation.

11. Click **Apply.**

The second proposal is generated and both proposals appear.



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Follow the design workflow sheet. You can adjust each proposal individually and some tools are available with the ALL tab. Do NOT use Material Thickness on the ALL tab.

Manipulate individual proposals without switching tabs	Tools that you CANNOT use with ALL
• Freeform Change Tools • Rubber Tooth • Dropper • Smooth Surface	• Material Thickness • Paint Feature • Define Feature • Contact Refinement • Move Feature • Move Margin

12. Finish designing both proposals.

End of exercise. Do not proceed to the mill tab.

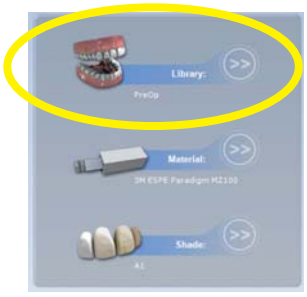
Anterior Crown Using Pre-op

Tooth #8 (1-1 ISO)

This case has already been scanned.

Setup

On the setup tab, note that the **Library** is **Pre-op**. No actions are required on this tab.



Note: Select Pre-op as the Library tooth when the patient's existing dentition or a wax-up is being used as the model for creating the restoration.

Scan

1. Click the **Scan** tab, **Pre-op** is active.

2. Evaluate the Pre-op model.

3. Click **Scan Prep.**

4. Evaluate the prep model. Note that the same amount of data was captured on both models. You need sufficient data on the adjacent teeth to match your preparation model.

Note: There is no bite registration or buccal bite for this case because the Pre-op scans will be used for occlusion. In your office, Time Saver prompts you to copy the data when moving from the Pre-op to Prep scans. This enables you to erase the pre-op tooth and scan in the prep.

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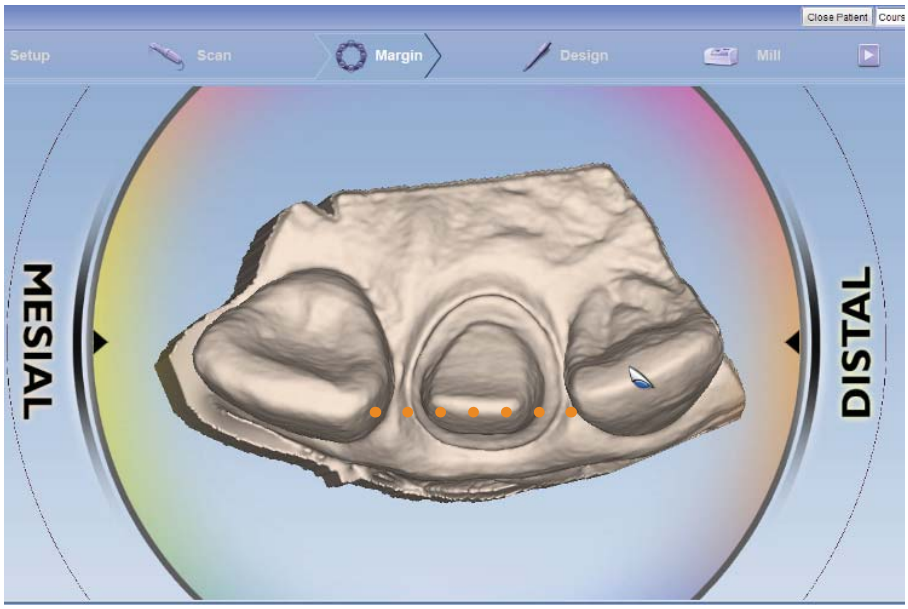
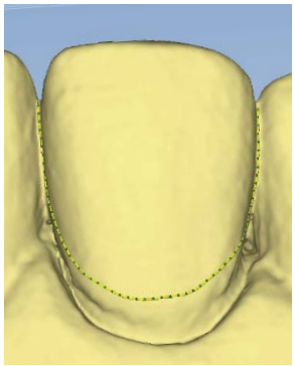
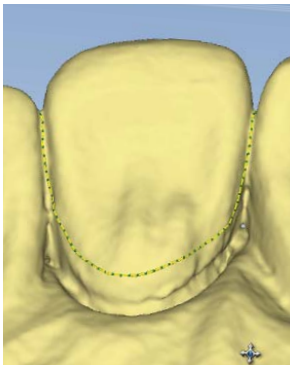
Margin

1. Click the **Margin** tab.
2. Evaluate the Orientation.
   - Are the surface indicators correct? If you accidentally scanned with the wand pointing towards the mesial instead of the distal, the surface indicators will be incorrect. If this happens, rotate the model until the Lingual, Mesial, Distal, and Buccal labels are correct.
   - Are the marginal ridges of the adjacent teeth straight across from mesial to distal? (Orange line used as an illustration below)



3. Click **Orientation** when you are satisfied with the position of the model
4. Click **Show Features.**
5. Draw the margin.
6. Click **Pre-op Editing.**
7. Use the **Trace** tool to designate the area of the model that you want to use as the Pre-op library surface. Stay away from rough areas and the margin.

8. Use **Move Curve** and **Add Segments** to edit the Pre-op if needed.

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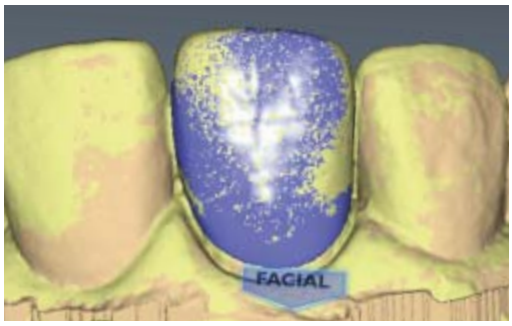
Design

1. Click the **Design** tab.

Note that the Library at the bottom of the screen now includes Pre-op.

2. Click **Apply.** Autogenesis creates a proposal based on the Pre-op area that you designated.

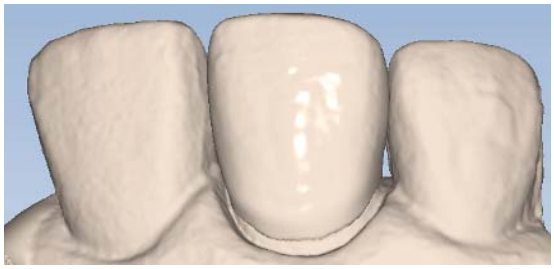
3. Click **View Pre-op** to see the combination of the pre-op model and the prep model. The speckled area is where the proposal was created from the pre-op designation. The solid area around the margin is where Autogenesis used Library A to fill in any gaps.



4. Click **View Pre-op** a second time to make the pre-op model translucent.

5. Continue designing the proposal. Follow the standard workflow.

6. Click **Ctrl+Alt** to view the proposal in Medusa View. This turns the proposal the same color as the rest of the model, making it easier to evaluate the overall shape. Click **Ctrl** to deactivate Medusa View.



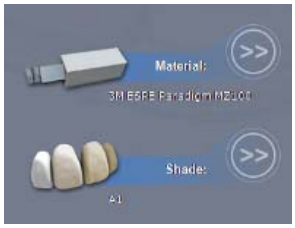
Mill tab

1. Click the **Mill** tab.

For this exercise, we will change the material to an IPS Empress Multiblock.

2. Click **Settings** in the upper right hand corner.

3. Click **Material/Shade Settings.**



4. Click the arrows next to Material and select **IPS Empress CAD Multi.**

5. Click **Save.**

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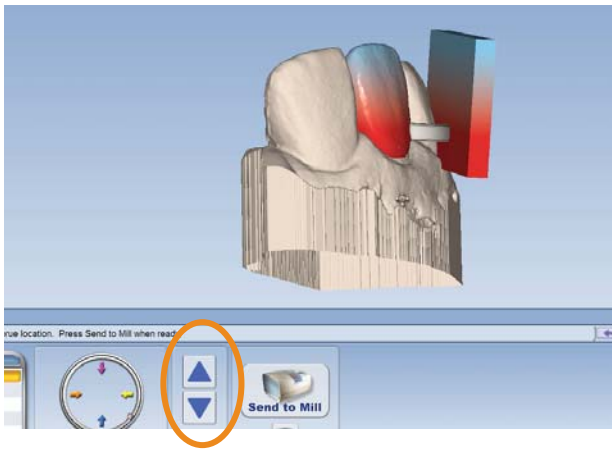
6. Because the IPS Empress Multiblock was selected as the material, the amount of chroma and translucency can be adjusted. Use the **Restoration Positioning** arrows to move the restoration up or down within the block.



End of exercise. Do not Send to Mill.

Posterior Crown Impression

Tooth #2 (1-7 ISO)

Setup

Enter the setup information for this case. This is a scanning exercise. The case will not be fully designed and milled.

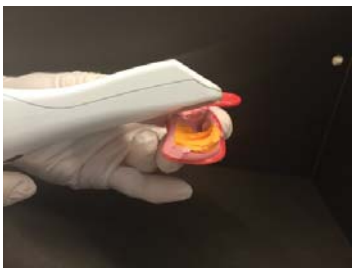
- **Tooth 2 (1-7 ISO)**
- **Crown**
- **Library A**
- **Select any material**
- **Select any shade**

Scan

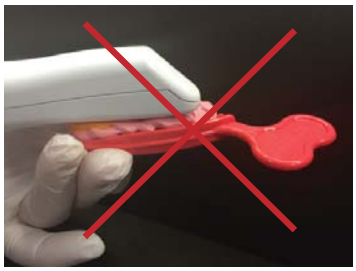
1. Click the **Scan** tab.

When scanning the impression, ensure the tip of the scanner is pointing towards the distal so that the orientation of the model will be correct. Be careful not to squeeze the impression while scanning or the scans will be distorted. Note that this impression has already been trimmed.

Starting position



Perpendicular for interproximals



Backwards starting position

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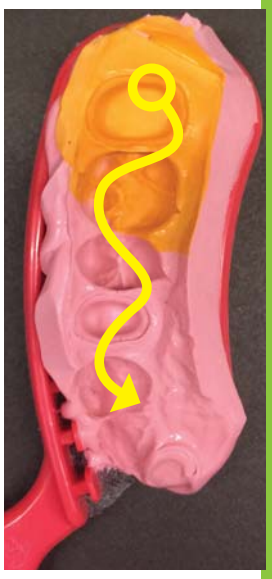
2. Scan the impression.



Make small rotations to capture the data on the buccal/lingual walls.

Note: Hold the scanner perpendicular to the impression, rotate left and right to capture data.

Goals

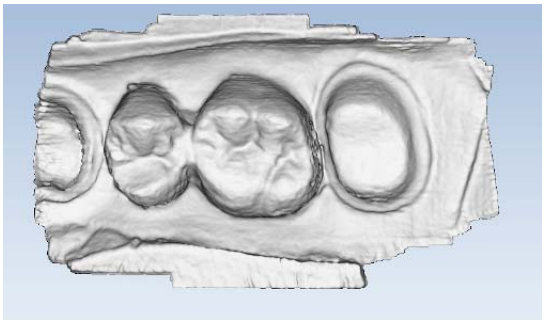
100% of the prep and interproximal contact areas

90% of the adjacent teeth

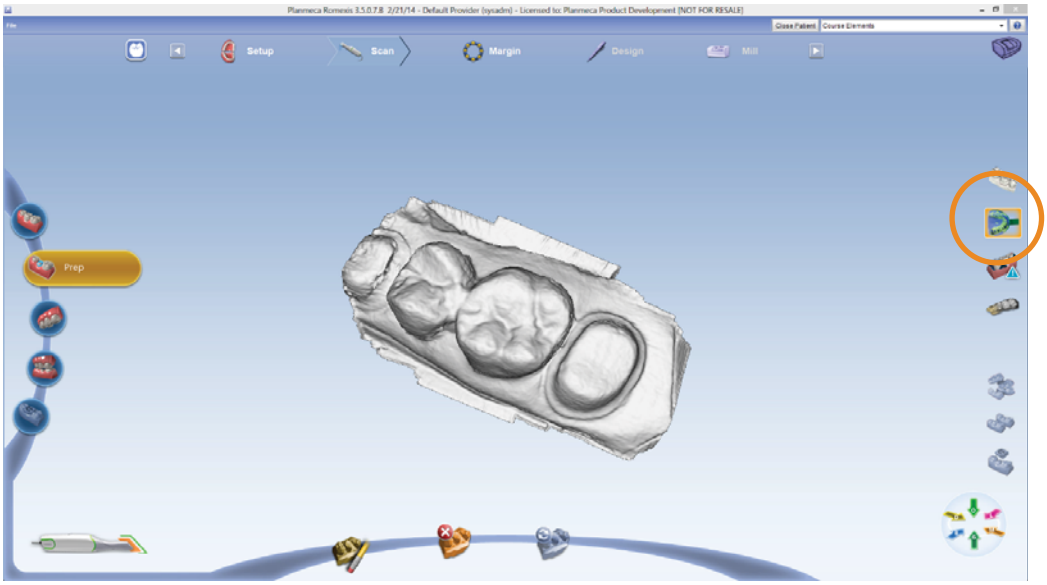
Good axial data for design

2-3 mm gingival tissue on buccal and lingual

The model is inverted since you scanned an impression. Rotate to view the negative image.



3. Click **Impression Mode** to create a positive version of the model.



4. Click **Data Density View** and evaluate your model. This can be done either before or after activating Impression Mode.

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For this exercise, we are not scanning the opposing dentition. In clinical cases, the data needs to be scanned using one of the following methods:

- **Pre-Op -** In Scan Pre-op, scan the preoperative tooth intraorally or take a preoperative impression.
- **Intraoral Bite Registration -** Apply bite registration material and scan intraorally.
- **Model Bite Registration -** Take a bite registration, scan the impression, pour up the impression to create a model, and scan the bite registration on the model.
- **Articulated Model Buccal Bite -** Create an articulated model using both sides of the impression. Use the articulated model to scan the buccal bite.

End of exercise.

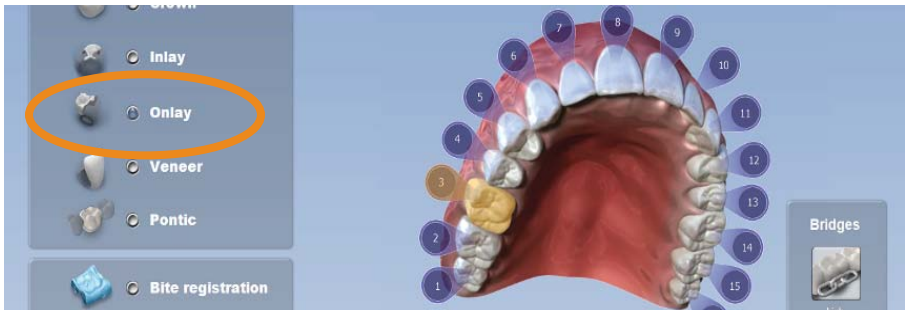
Onlay Restoration

Tooth #3 (1-6 ISO)

This case has already been scanned.

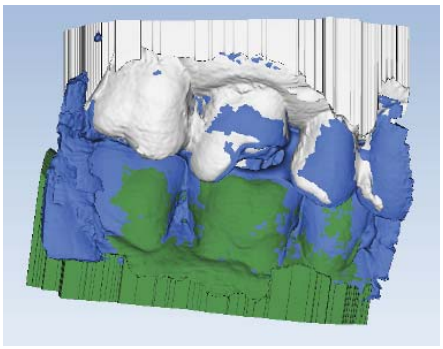
Setup

On the setup tab, note that the Restoration Type is Onlay. No actions are required on this tab.



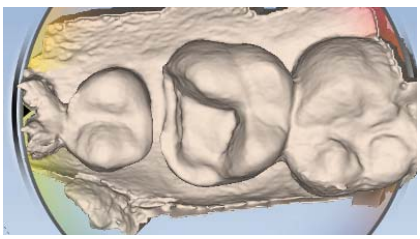
Scan

1. Click the **Scan** tab.
2. Evaluate the preparation model. The same basic scan pattern is used for partial restorations.
3. Click **Buccal** to view the previously scanned buccal bite model and evaluate.

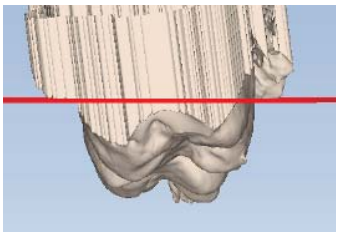


Margin

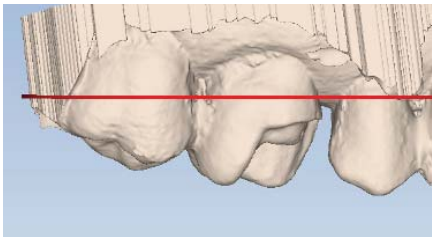
1. Click the **Margin** tab.
2. Set the **Orientation** for the onlay. Use the remaining anatomy of the prepped tooth to aid your orientation.



Occlusal View



Distal View



Buccal View

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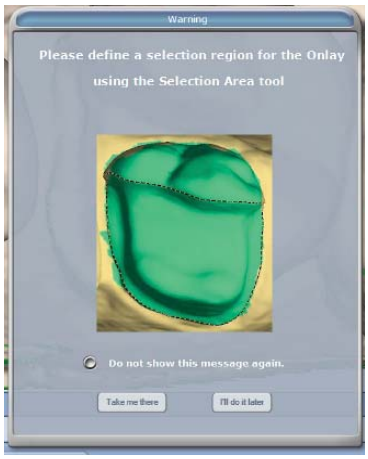
3. Activate **Show Features.**

4. Draw the margin.

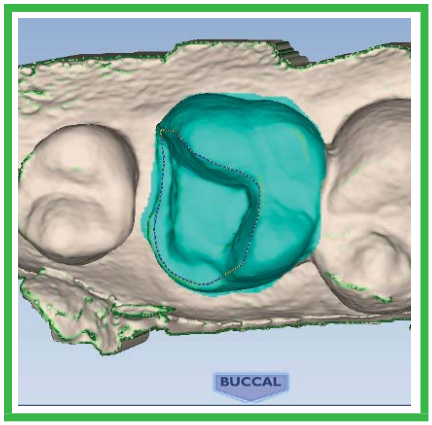
Once the margin is drawn, a screen appears. This only appears for inlays and onlays.


Warning
Please define a selection region for the Onlay
using the Selection Area tool
Do not show this message again.
Take me there
I'll do it later

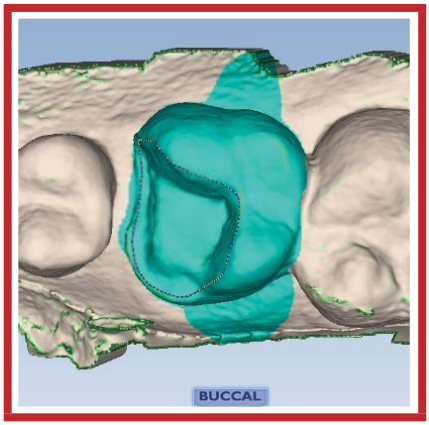
Note: If this screen doesn't appear, click **Selection Area.**

5. Click **Take Me There** to go to the Selection Area screen.

6. Click **Add to Selection** and circle Tooth 3 (1-6 ISO).



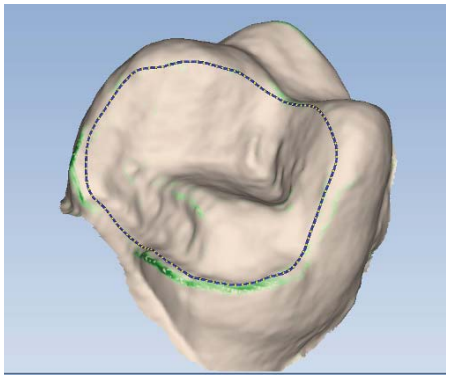
Good Selection



Poor Selection

7. Complete the Selection Area and return to the **Margin Tool** screen.

8. Click **Hide Model** to isolate the preparation and to evaluate and adjust the margin.



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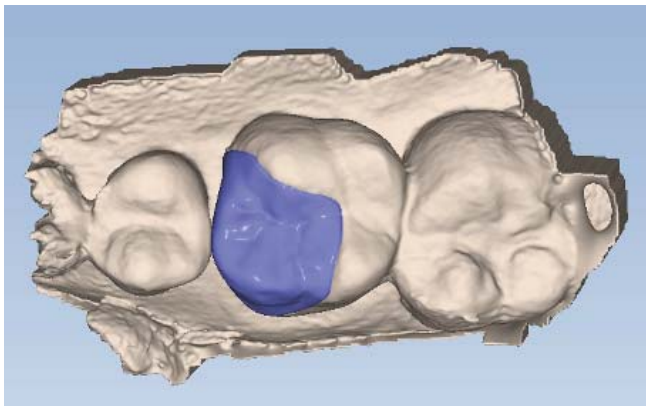
Design

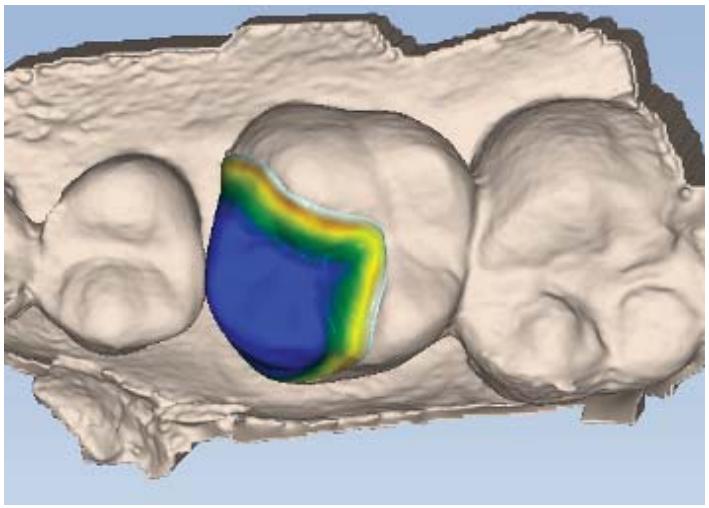
1. Click the **Design** tab.

Autogenesis creates a proposal based on the Selection Area designated.

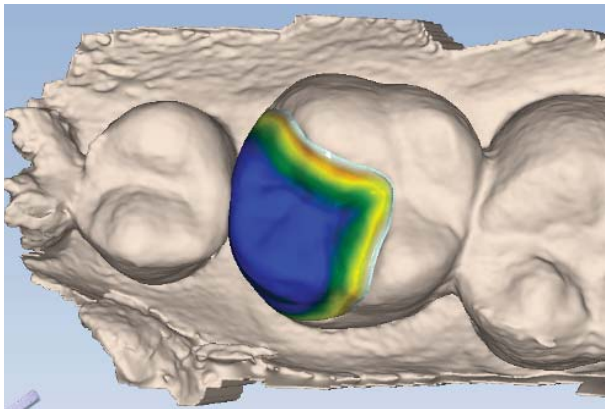


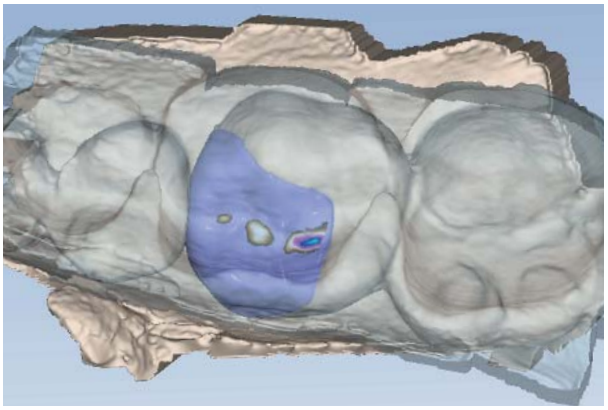
2. Follow the basic design workflow to design the onlay.

In some situations, it will be difficult to attain ideal occlusal contact strength and reach minimum material thickness. In the example below, the red material thickness around the margin indicates the margin is too thin.



3. Click **Dropper** and add material thickness. This will result in adequate material thickness strength but a strong contact with the opposing dentition. This can be corrected intraorally.





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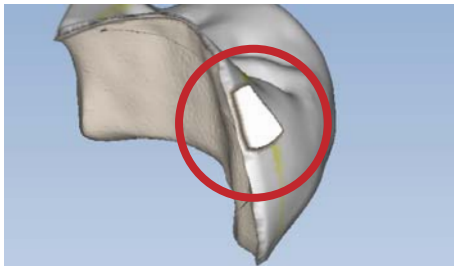
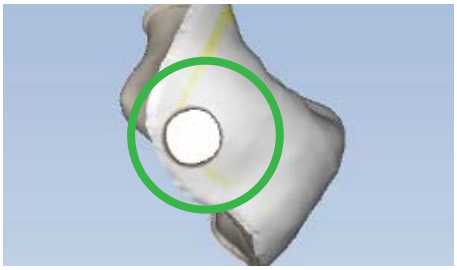
Mill

1. Click the **Mill** tab.
2. Click **Hide Model.** The sprue is hidden when the model is visible.
3. Sprue placement options are limited. In this situation, the sprue must be placed on the interproximal contact area.
4. Ensure the total circumference of the sprue is visible.





End of exercise. Do not Send to Mill.

Posterior Crown with Bite Registration

Tooth #30 (4-6 ISO) with bite registration

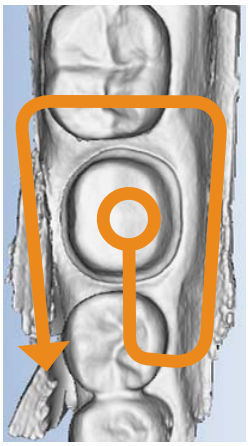
Setup

Enter the setup information for this case:

- **Tooth 30 (4-6 ISO)**
- **Crown**
- **Bite Registration**
- **Library A**
- **e.max HT**
- **Select shade B1**

Scan

1. Scan prep using the basic scan method.



Begin scanning directly over the occlusal surface of the preparation. Move in a gradual, continuous motion toward the mesial neighbor. Transition from the occlusal, cusp, axial wall, to gingival surfaces. The scanner should be held at close to 90° while scanning parallel to the buccal surface.

Use small rotations over the mesial proximal neighbor, transition from occlusal, cusp tip, axial wall, to gingival.

Scan along the lingual surface of the teeth. Rotate the scanner to almost 90° from the occlusal table.

Watch as your model builds to see any areas that might require a different rotation or angle.

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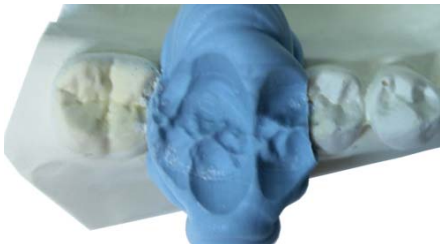
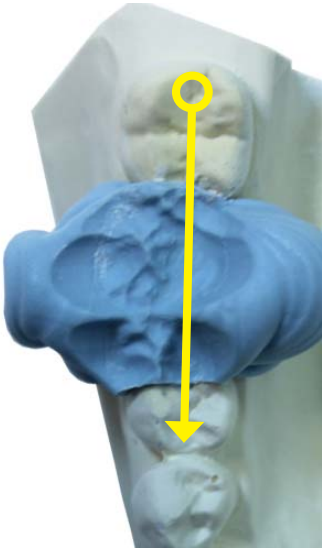
2. Erase any unnecessary data such as tongue, cheek, and cotton rolls.
3. Apply bite registration material.
   - Apply enough material vertically and horizontally
   - Do not smooth with fingers
   - Evaluate model and trim material away from adjacent teeth



Good - The marginal ridges are covered, occlusal tables of the adjacent teeth are visible.

Poor - There are gaps between the bite registration and the neighboring teeth.

4. Scan the bite registration and evaluate model for sufficient data.

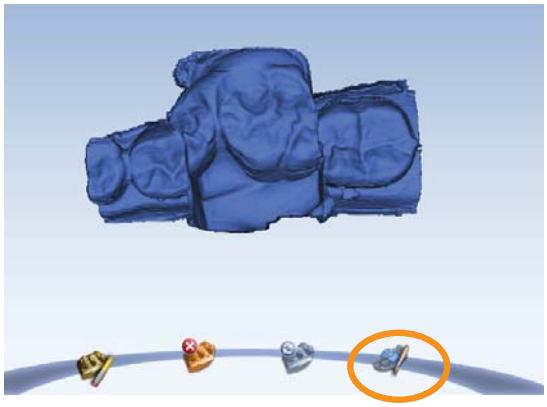


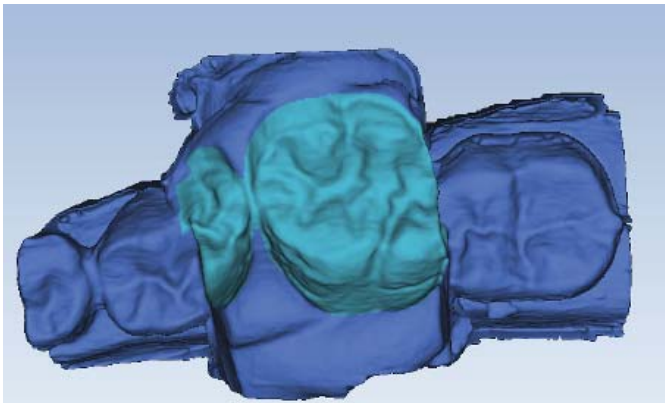
Goals

100% occlusal data

No lingual or buccal data necessary

5. Click **Bite Selection.**
6. Paint the area of the opposing dentition within the bite registration material.





Proceed with the normal Margin tab and Design tab workflow.

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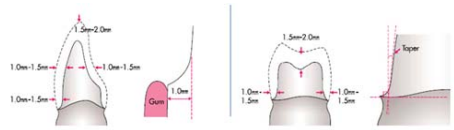
Prep Guidelines & Materials

Prep Guidelines

Manufacturer Specifications

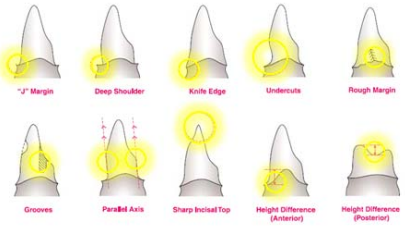
T	R	E	A	T
Tapered Sides	Rounded Angles	Equi/Supra Gingival	Adequate Reduction	Tissue Managed



PLANMECA E4D TECHNOLOGIES

Prep Guidelines

Manufacturer Specifications



PLANMECA E4D TECHNOLOGIES

Prep Guidelines

Manufacturer Specifications

PLANMECA E4D TECHNOLOGIES

Presentations

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Tissue Management & Prep Reduction

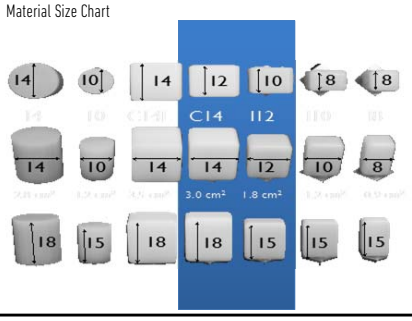
Requirements and Job Aids

PLANMECA E4D TECHNOLOGIES

Material Selection

Block Size Selection

Material Size Chart



- Materials come in a variety of sizes.
- The size of the designed restoration and sprue position will determine the available size to mill.

PLANMECA E4D TECHNOLOGIES

IPS Empress CAD

Leucite-Reinforced Glass Ceramic Blocks

ivoclar vivadent
passion vision innovation

Beautiful Esthetics

- IPS Empress CAD offers over 100 combinations of block size, shades, and translucencies to meet the esthetic demands of your patients.

Multi Shade & Translucency

- Cut back and layer esthetics in a monolithic block
- Multiple translucencies create the most natural looking, esthetic restoration
- "Control" incisal translucency and gingival color

PLANMECA E4D TECHNOLOGIES

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IPS Empress CAD

Leucite-Reinforced Glass Ceramic Blocks

ivoclar vivadent: passion vision innovation

High Translucency

- Excellent chameleon effect
- Blends easily with existing tooth structure
- Inlays virtually "disappear"
- 20% more translucent than the Low Translucency Block

Low Translucency

- Higher value
- "Block out" capability. Higher opacity level

PLANMECA E4D TECHNOLOGIES

IPS Empress CAD

Leucite-Reinforced Glass Ceramic Blocks

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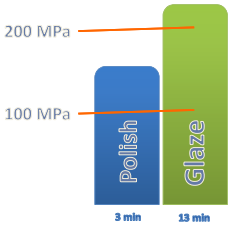
Efficient

- IPS Empress CAD offers the option to simply mill and polish for maximum efficiency or glaze fire for up to a 50% increase in strength*.

*Clinician's Report – October 2009, Volume 2 Issue 10



PLANMECA E4D TECHNOLOGIES

IPS Empress CAD

Leucite-Reinforced Glass Ceramic Blocks

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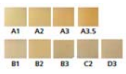
Multi

- A1, A2, A3, A3.5, B1
- BL1, BL3



HT (High Translucency)

- A1, A2, A3, A3.5, B1, B2, B3, C2, D3

LT (Low Translucency)

- A1, A2, A3, A3.5, B1, B2, B3, C2, D3
- BL1, BL2, BL3, BL4

PLANMECA E4D TECHNOLOGIES

Presentations

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IPS e.max CAD

Lithium Disilicate Glass Ceramic Blocks

ivoclar vivadent: passion vision innovation

Beautiful Esthetics

- IPS e.max CAD offers a wide range of shades, sizes, and translucencies to allow the dental professional to provide beautiful esthetics and the durability to ensure clinical success for all indications

The Highlights

- True-to-nature shade behavior for highly esthetic solutions
- Versatile use and comprehensive range of indications
- Lifelike esthetics, irrespective of the shade of the preparation

PLANMECA E4D TECHNOLOGIES

IPS e.max CAD

Lithium Disilicate Glass Ceramic Blocks

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Benefits

- Durable restorations due to the high strength
- Adhesive, self-adhesive or conventional cementation depending on the indication

New Materials

- C16
  - Ideal for longer dentition and large restorations
- B32
  - Up to three-unit bridges up to the second premolar as the abutment tooth

PLANMECA E4D TECHNOLOGIES

IPS e.max CAD

Lithium Disilicate Glass Ceramic Blocks

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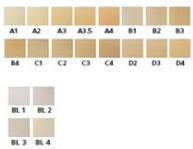
HT (High Translucency)

- A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4
- BL1, BL2, BL3, BL4

LT (Low Translucency)

- A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4
- BL1, BL2, BL3, BL4



C16 & B32 Blocks

- A1, A2, A3, A3.5, B1, B2, C1, C2, D2
- BL1

PLANMECA E4D TECHNOLOGIES

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IPS e.max CAD Impulse

Lithium Disilicate Glass Ceramic Blocks

Value blocks – various brightness values

- The Value blocks feature different brightness values: 1 is the lowest and 3 the highest.
- This allows optimum integration of the restoration into the intraoral situation – regardless of whether the tooth shade is to be individually adjusted in the case of a given brightness value, or whether the same brightness level is required for preparations with different shades.

Opal blocks – lifelike opalescence effect

- The Opal blocks exhibit a decreasing opalescence and increasing brightness value from 1 to 2.
- Their unique opalescence and strength, the Opal blocks can be used as an "enamel replacement" material.
- Aesthetic and minimally invasive restorations – thin veneers in particular.

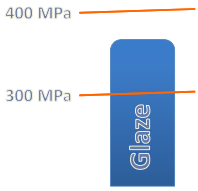
PLANMECA E4D TECHNOLOGIES

IPS e.max CAD Impulse

Lithium Disilicate Glass Ceramic Blocks

Advantages

- Lithium disilicate glass-ceramic (LS2) with a strength of 360 MPa
- Opal blocks for highly esthetic, minimally invasive veneers with a minimum thickness of 0.4 mm
- Value blocks for lifelike brightness value in crowns



PLANMECA E4D TECHNOLOGIES

Telio CAD

Temporary Restorative Acrylic Polymer Blocks

Strength and Endurance

- Long term temporary bridge material (12 mo.).
- Flexural strength of 130 MPa

Esthetic

- Polyacrylate material technology allows for beautiful esthetic results simply by polishing or with the option to apply stains and glaze for a customized appearance.

Shades

- A1, A2, A3, A3.5, B1
- BL3

PLANMECA E4D TECHNOLOGIES

Presentations

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ivoclar vivadent
passion vision innovation

www.ivoclarvivadent.com

Lava Ultimate

3M ESPE

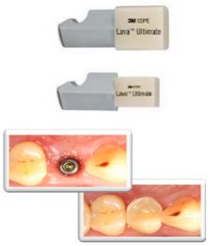
Resin Nano Ceramic Blocks

Nano Technology

- High flexural strength (200 MPa) adds durability to posterior restoration
- Excellent wear resistance
- Brilliant and long-lasting polish
- Excellent stain resistance for color stability

Shades

- A1, A2, A3, A3.5, B1, C2, D2
- BL



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Paradigm MZ100

3M ESPE

Composite Blocks

Versatile and Easy

- Created from 3M™ ESPE™ Z100™ Materials
- High flexural strength and fracture toughness
- Enamel-like wear characteristics are superior to that of ceramic blocks
- Easy to finish and polish
- Can be easily characterized with light-cured composite stains and glazes
- Ideal material for CAD/CAM where strength and occlusal wear properties are needed
- Easy to repair intraorally

Shades

- A1, A2, A3, A3.5, B3
- Enamel

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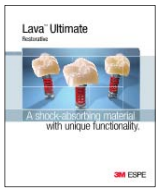
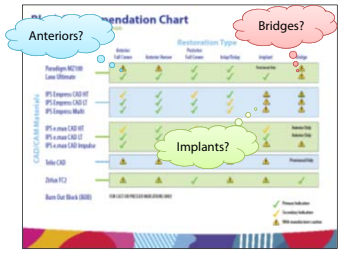
3M ESPE



www.3MESPE.com

Options to think about.

- Choose the best option for your patient
- Call your manufacturer representative for more details
- View manufacturer websites for more specific indications and uses



Remember to always follow the manufacturer instructions provided with each type of material.

For additional information regarding the content in this presentation. Please contact the manufacturer for the product in question.

Presentations

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Integration Day & Starter Kit

Integration Day

Start Planning Today

Keys to success on this 3rd day of training:

- Day starts at 7:30am and ends 3pm
- 3 Pre-prepped, Single Unit, Posteriors
- Schedule patients at 8am, 10am, and 1pm
  - Allow 3 hours for the first appointment
- Lunch and Learn
  - Mill maintenance
  - DDX Setup
  - Discuss how to continue with your education
- No other patients scheduled
- Focused on those who attended Elements course in Texas

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Starter Kit

Items from Premier

1 Diamond Twist Paste Kit
1 Traxodent Sample
2 Sample Prep Burs
1 Milling Tools Sample Pack
- 2 Ellipsoidal
- 2 Conical
- 2 Tapered

1 Sample Cord

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Starter Kit

Items from Ivoclar

Telio CAD:
4 Telio CAD Blocks
Telio CS Link Transparent
Telio CS Desensitizer 5g
OptraPol Test Pack

IPS e.max CAD:
4 e.max CAD Blocks
2 e.max Shades
1 e.max Stain
1 e.max Glaze Paste
1 e.max Glaze Liquid
1 e.max Crystallization Tray

IPS Empress CAD:
4 IPS Empress CAD Blocks
2 Empress Shades
1 Empress Stain
1 Empress Glaze
1 Empress Glaze Liquid

Misc. items:
2 Multilink Primer
1 Monobond Plus
1 Ceramic Etching Gel
1 Multilink Automix Trans
1 Optrastick
1 OptrafinePromo Pack
1 Object Fix Putty
Cementation Navigation DVD

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Starter Kit

Items from E4D

- Mill Coolant
- Defoaming Solution

PLANMECA E4D TECHNOLOGIES

Starter Kit

Items from 3M

Lava Ultimate :
5 A2 LT C14 Blocks
5 A2 HT C14 Blocks

Misc. items:
1 RelyX Ultimate Adhesive (A1)
1 Scotchbond Universal Adhesive
1 3M ESPE Retraction Capsule
1 CoJet Sand Blast Coating Agent
1 Lava Ultimate Guide

PLANMECA E4D TECHNOLOGIES

What's next...

Don't forget to order

Contact your local representative today:

- Order blocks in shade values for upcoming patients
- Order mill tools
  - 1 sleeve of each; Ellipsoidal and Tapered
- Stains and Shades for characterization
- Spray Glaze and speed tray for e.max (depending on order)
- High Level Disinfection:
  - Deionized Water and Cidex Plus
  - Distilled Water and MaxiCide Plus
- Lens tissues (KimWipes)
- Lab handpiece and Finishing Kit
- Sand blaster (if using Lava Ultimate)
- Prep Kits (recommended, not required)

PLANMECA E4D TECHNOLOGIES

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Information Resources

There are many resources available for gathering information.

If you have not already registered on our website, go to **www.e4d.com/eco** and enter your information.

Log In to **www.e4d.com/myaccount** or click **Customer Login** in the top right corner of the website. Click **Go to Member Resources** after you log in.

The Resources page **(www.e4d.com/resources)** includes:

- Documentation available for download. Printed copies are available for $25 each and can be ordered by emailing educationgroup@e4d.com.
- Create/Edit your Dentist Finder information - Dentist Finder is a tool on the website that enables the general public and potential patients in your area to locate you.
- Download Patient Marketing materials
- Chairside Chats (recorded webinars)
- Link to 3C Learning Library (links to cadcamcan.com - ability to search content by subject)

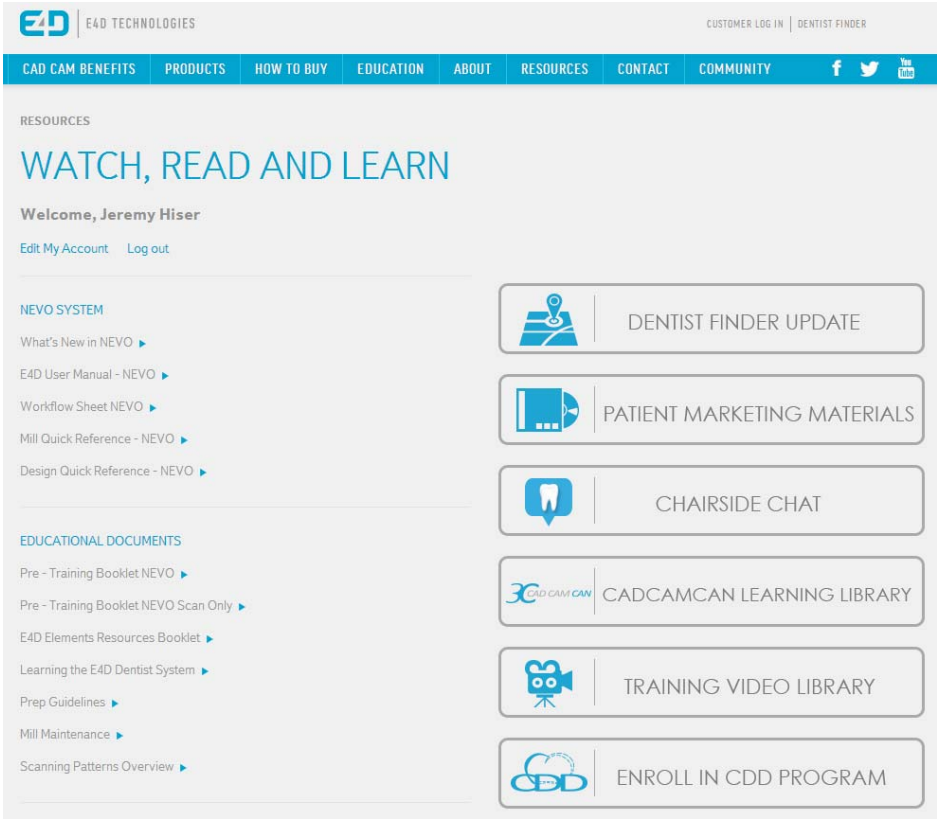
  Please note that cadcamcan.com is a separate site. To post on their forums, you will need to Create an Account on the cadcamcan.com website. The registration invitation code is **PlanScan** (case sensitive).

- Training Videos
- Register for the CAD/CAM Dental Designer (CDD) program

Newsletters, Chairside Chat, update information, and more is usually communicated via email. When you create your ECO Member account, you are automatically added to our email list. You may unsubscribe at any time.

The Online Help is always available within the Design Center software; simply click the red question mark.

The Help is updated along with your software. Videos are available on the Milling Center; simply click the movie icon.



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Customer Support Information

E4D system support

E4D Customer Support
1.800.537.6070
866.361.1333 corporate phone
972.234.3557 corporate fax

customersupport@e4d.com
7am-7pm Central Time Mon-Thurs
7am-6pm Central Time Friday

CDD Program

The CAD/CAM Dental Designer Program (CDD) provides motivated operators with the opportunity to gain professional recognition and establish credibility in proficiency with the latest dental CAD/CAM technology.

Requirements

Home study that should take 3-6 months, depending upon your use of the system.

Home Study Elements

Email **CDD@e4d.com** at the completion of each step.

- Learn from online resources. Visit the following sites and write a summary in 200 words or more on how the information was implemented in your office.
    - Go to **www.e4d.com/chairside-chat** and watch at least 4 videos on this site or **CadCamCan.com.**
    - One of the videos must be **Chairside Chat - Workflow Efficiency.** There is a 20 minute version and a Director's cut which is 40 minutes. You may watch either version. One of the videos must be **Chairside Chat – Materials.**
- Completion of ALL of the Workbook Exercises, following the instructions in the Workbook.

  The procedure for this task is being updated for the PlanScan systems. There is currently no workbook available. When the new procedure is active, an email will be sent to all registered CDD candidates. In the meantime, please proceed with the other tasks.
- Complete 20 CAD/CAM restorations and fill out the **Doctor Signoff Form** (included in the CDD Booklet) as you complete them. Email the completed form to **CDD@e4d.com** or fax it to **972-234.3557 Attn: Education Department.**
- Take **Before and After** pictures of 4 E4D restorations. Email the photos and **bite wing x-rays** of the seated restorations to **CDD@e4d.com.** Please combine these attachments into one email if possible.
- For the **Final Clinical Case** we will choose one special case from your CAD/CAM system for you to complete. A trainer will evaluate the case when you are finished and provide feedback.
- Satisfactory completion of the Final Exam.

How to register a new team member

Go to **www.e4d.com/resources,** click **Enroll in CDD Program,** and fill out the form. The new team member will receive the CDD packet by email. If you do not see the Enroll in CDD Program option under Resources, use the Customer Login at the top of the page.

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CAD/CAM Supplies and Documentation

The materials listed below are all items used at Planmeca University. They are grouped by item type. For new documentation, go to www.e4d.com/resources and use the Customer Log In to see customer documentation.

Documentation

Name	Vendor
User Manual	E4D Technologies
Milling Center Quick Reference	E4D Technologies

Infection Control

Name	Vendor	Item Number
Alcohol Prep Pads	Schein	1048298
MaxiCide Plus w/ Activator	Schein	102-5796 (Qt) 102-2865 (Gallon)
MetriTest Strips	Schein	602-3437
Distilled Water	Schein	395-0139
Gloves	Schein	
X-Small		5654510
Small		5658087
Medium		5657431
Large		5659481
X-Large		5651575
Allrap Cover Film 4x6 Clear	Schein	1273240
Steri-Soaker	Schein	6581402

Preparation Design

Name	Vendor	Item Number
Two Striper Full Crown Kit	Schein Premier	3780210 2013581
Two Striper Inlay/Onlay Kit	Schein Premier	3780213 2013582

Impression and Model Materials

Name	Vendor	Item Number
Earth Stone - Quick Set Stone	Schein	9662932
Orban 1/2 Perio Blade for trimming bite registration	Premier	1004751

Scanning

Name	Vendor	Item Number
Scanning Tips (Pack of 3)	Schein	6314915
Optical Wipes - Kimwipes	Schein	1017070
Ergotron Cart (smaller)	Schein	1276580
Enovate Cart (larger)	Schein	6310850

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Milling Center

Name	Vendor	Item Number
Coolant	Schein	6311524
Defoaming Solution	Schein	6318999
Two Striper E4D Mill Diamonds (Burs)		
Conical	Schein Premier	3781031 2016002
Ellipsoidal	Schein Premier	3780560 2016001
Tapered	Schein Premier	3786546 2016000
Assorted	Schein Premier	3780206 2016004

Restoration Finishing

Name	Vendor	Item Number
Two Striper Finishing Kit	Schein Premier	3780201 2013553

Articulating Paper

Name	Vendor	Item Number
Accufilm I Single Sided Red Articulating Paper	Schein	1865309

Clinical materials and accessories (cements, adhesives, stains & glaze, etc.)

Ivoclar Vivadent

Rebecca Spillman, MS

Ivoclar Vivadent
175 Pineview Drive
Amherst, NY 14228
716.691.2248 phone
rebecca.spillman@ivoclarvivadent.com

3M ESPE

Bill McGlynn

3M ESPE
3M Center Bldg. 275-2SE-03
St. Paul, MN 55144-1000
651.733.9078 phone
bfmclynn@mmm.com

Premier Dental Products Company

John Bonner

Premier Dental Products Company
1710 Romano Drive
Plymouth Meeting, PA 19462
610.239.6022
888.773.6872 Ex. 1022
jbonner@premusa.com

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NOTES

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Block Recommendation Chart

Manufacturer Specifications for Materials

PlanMill 40™ E4D TECHNOLOGIES

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IPS e.max CAD

Characterization Process

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1

Preparing the restoration

Object Fix

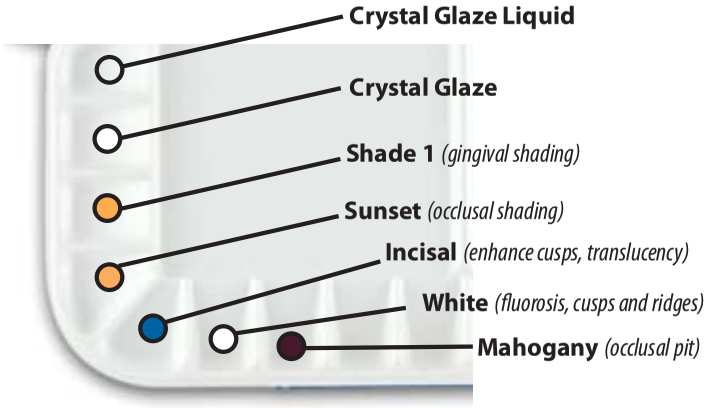
Flow (shown) will be used to affix the restoration to the firing pin for characterization and firing. Object Fix - Putty can also be used

Crystallization Tray

After characterization place the restoration onto the crystallization tray for firing. Note there is an additional Speed Crystallization Tray for IPS e.max

2

Characterization of IPS e.max



3

Oven program and firing

Information bar
Indicates current furnace temp and selected furnace programs

Main screen
Indicates the selected firing program, firing progress, and other menu options

Navigation bar
Browse between programs and settings

Program Information

P1 - IPS e.max

P2 - Corrective firing

P3 - Speed crys. spray

P4 - Empress

Scanning Technique
Goals & Patterns

PlanScan™ E4D TECHNOLOGIES

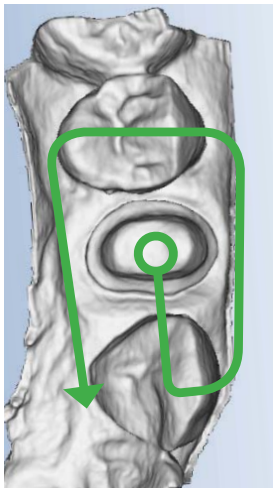
Preparation

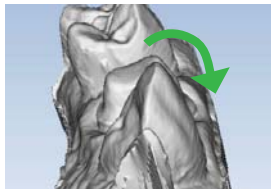
100% of the prep and interproximal contact areas

90% of the adjacent teeth

Good axial data for design

2-3 mm gingival tissue on buccal and lingual





Interproximal

To achieve 100% of the interproximal contact area, a slight rotation of the scanner will be needed

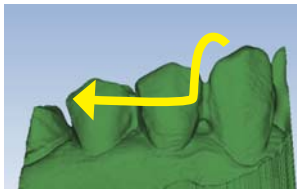
Rest the scanner on the proximal dentition and perpendicular to the arch

Opposing

100% of the cusps

2-3 mm gingival tissue on the buccal side

Lingual and gingival data not necessary

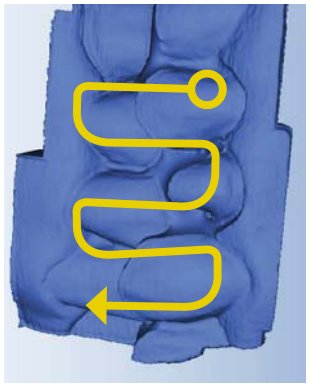


Buccal Bite

Capture the buccal surface of the dentition in the prep and opposing

2-3 mm gingival tissue

No rotations necessary



Note: Information on scanning Bite Registration material can be found in the User Manual

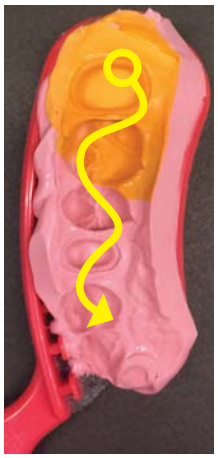
Impressions

100% of the prep and interproximal contact areas

90% of the adjacent teeth

Good axial data for design

2-3 mm gingival tissue on buccal and lingual



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CAD/CAM Workflow

QUESTIONS ABOUT DESIGN? Contact Support @ 800.537.6070

PlanCAD™ E4D TECHNOLOGIES

SCAN

Buccal Bite Scanning

Scan Prep

100% of Prep and contacts

Click **Data Density View** to evaluate for low data

Use the **Eraser** tool to remove excess scan data

Scan Opposing

100% Occlusal and 2mm of buccal gingival data

Scan Buccal

Capture all teeth associated in Prep & Opposing scans

Verify buccal alignment, and re-align if needed

! Verifying the appropriate amount of scan data will ensure a better fitting restoration.

MARGIN

Orientation

Automatically active; use the View Circle to position model

Occlusal - Buccal/Lingual tip
Distal - Align buccal cusps
Buccal - Marginal ridges

Trace Margin

From the occlusal view, mark the margin on the shoulder

Click **Show Features** as an aid to highlight high contour areas

Use **Move Margin** to adjust placement

Use **Add Segments** to redraw a portion

Orientation Guide

After deactivating all tools, use the green Preview Tooth to verify orientation.

Margin Marking Guide

ICE mode can be used in margin detection; remember stone mode is priority

DESIGN

Tooth Libraries

Autogenesis™ ON - Click APPLY
Autogenesis OFF - Resize, Reposition, Re-Apply

Incremental Tools

Large adjustments to tooth position - Fitting the proposal in its space

Freeform Change Tools

Small adjustments to contour - Fine tuning the design

Material Thickness

Occlusal table - 1.5 to 2 mm (Dark Green/Blue)
Axial walls - 1.0 to 1.5 mm (Green)
Margins - Yellow

Rubber Tooth

1st - Axial Walls
2nd - Marginal Ridges (Occlusal Table if needed)
3rd - Embrasures

Adjusting the Bite

Activate **View Bite Registration** (click twice) then activate **View Contacts** to evaluate. Use **Contact Refinement** (small circles) to adjust to White, Brown, Black.

Adjusting Interproximal Contacts

Turn OFF **View Bite Registration** and activate **Hide Model**. Rotate to the mesial and distal to evaluate interproximal contacts. Return to ***Freeform Change Tools, use Smooth Surface to adjust*** to Light Green/ Aqua surrounded by Dark Blue.

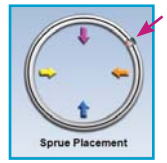
Recheck Material Thickness & Check Margins

Verify that design changes have not affected the appropriate material thickness for milling.

Margins should be Yellow. If Red/Orange, verify margin placement with **Move Margin**. Use **Dropper** as needed to add material.

MILL

! Bright Yellow on the occlusal or axial surfaces indicates low material thickness and should be adjusted in the Design tab.



Sprue Position

Away from margins, contacts, and occlusion. Initial position is the fastest milling time. Verify the end of the sprue is round.

Mill Sim

Check the internal fit of your restoration before milling.

Block Size Selection

Available block sizes depend on sprue position and the material selected.

Congratulations!

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